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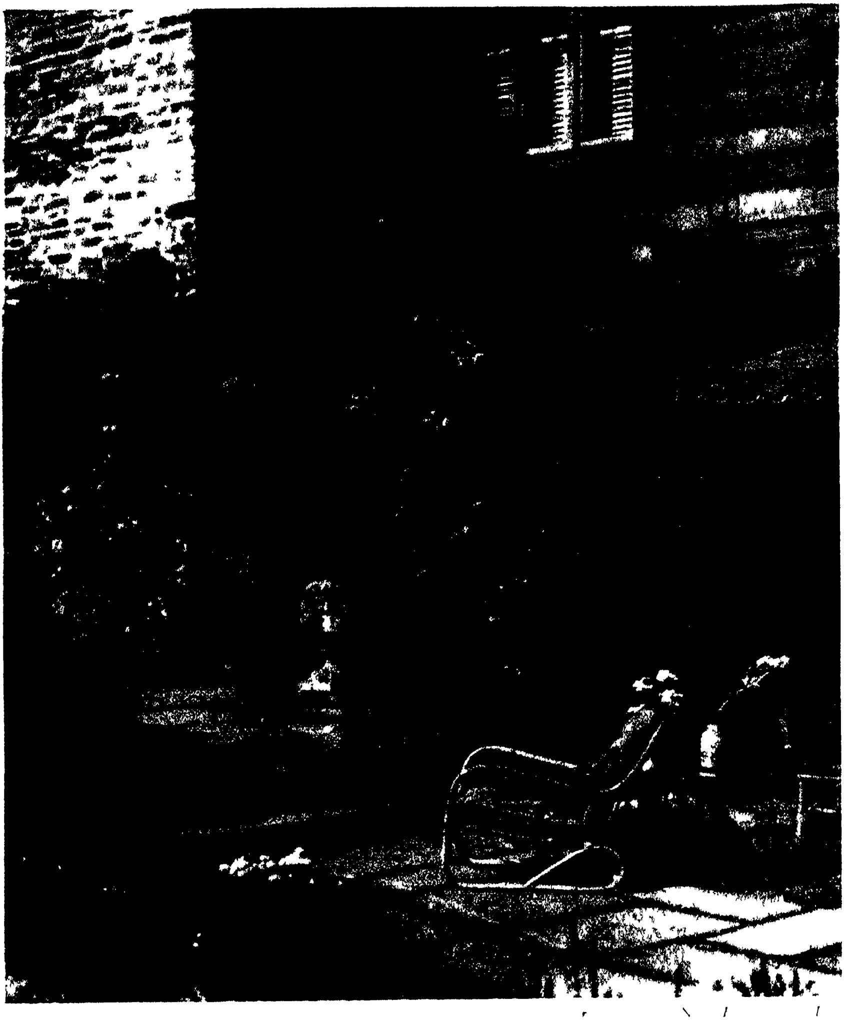
THE STORY OF GARDENING



THE HIGHEST PURPOSE OF GARDENING ART IS ATTAINED WHEN A GARDEN RELATED TO THE HOUSE AND SUITABLY FURNISHED IS DESIGNED FOR LIVING

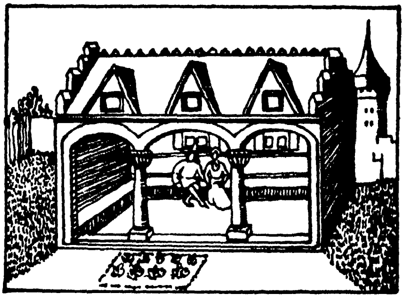
THE STORY OF GARDENING

FROM THE HANGING GARDENS OF BABYLON
TO THE HANGING GARDENS OF NEW YORK

By

RICHARDSON WRIGHT

EDITOR OF *House & Garden*



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TO THE MEMORY
OF MY FRIEND AND MASTER
ERNEST HENRY WILSON
1876–1930

He shall be like a tree planted by the rivers
of water . . . his leaf also shall not wither

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THE STORY OF GARDENING

CHAPTER I

THE WAYFARING OF GARDENS

IN one of his essays Sir Arthur Quiller-Couch spins a plausible yarn about a Roman légionnaire slogging along a muddy road in Gaul toward far-away Britain. The Channel finally crossed, he flings his march-worn, mud-caked boots into a ditch. Next year, from those clods of Gallic mire, springs up on British soil a wild flower that never grew there before.

By even such romantic chance has many a flower passed from its native heath to foreign lands, and many a garden, flourishing today to delight our eyes, has travelled an equally twisted trail of fortuitous migration.

Come out into the garden on a day in June. Step down from the door on to the terrace. At once we encounter the marks of wayfaring. This terrace, with its studied figures in brick and stone flagging—whence sprang the idea? Did ancient Rome have such terraces? And who first conceived this transition place between the house and the garden?

Along the coping range plants in pots, and around the rim of the pool are clustered others—as little chicks crowd about the mother hen. Where did that fashion have its beginning? Was it by accident, or does the stately parade memorialize some olden belief?

From the terrace steps, a straight path leads away to the farther wall. Midway, it is divided by the circle of the pool, from which, on each side, extends a side path. The geometry of this layout is apparent at a glance. How came it that such a precise diagram was laid down in a garden for the first time? And into what dim and romantic times does that straight-lined path reach?

At the farther end stands a summer-house, with grapes and roses mingling democratically over the roof. Can it be that even this bower boasts a checkered history?

As we pass along we notice how the flowers are planted in little plots edged with clipped box and that these plots are arranged in a pattern. How far has that idea of a patterned garden travelled from its first conception to this day?

The garden is enclosed by a wall or fence. Who first walled in his garden, and why did he do it?

Amid the flowers, tending them with intelligent and loving care, is the mistress of the place. Her hands are grimed and her hair awry, for she is actually working in her garden. Have women always done so—Roman matrons and Levantine odalisques in "hushed seraglios" and mediæval housewives? In the long zigzag upward of the human race, what part has woman played between garden walls so that today—in this country at least—she should be the leading genius of gardening?

Yonder, where the vegetables grow, a gardener turns on a long pipe that sprays jets of water from side to side like gentle rain. The thirsty earth drinks it up and the vegetables sparkle with its drops. Surely this, too, is a very aged custom, this irrigation of gardens; but by what steps did it rise from its first unskilful beginnings to this convenient similitude of rain?

Farther along, the garden loses its straight path; its beds bulge in wide curves and its walks wind hither and yon. Is this some new revolt against rigid formality, or did even this naturalism grow out of a picturesque evolution? And into what dim forest glade does that winding history lead?

Here, instead of regular beds that form a pattern, bushes and flowers seem heaped together with the casual informality of Nature in a woodland or a meadow. Who was it first contemplated the wild beauty of the country-side and sought to imitate it in his garden? And along what by-ways did that first imitation travel from its ancient source to this garden in the New World?

Amid a grove of trees stands a marble figure—the figure of a faun. Why a faun? And what place does it fill in a garden? And what did it, and others like it, mean to men and women in the past and to the first man who set it up, these many centuries ago?

The turn of the path brings us to the green fountain of a bush along the arching sprays of which rest little garnet blossoms, like tiny butterflies. Its label carries a staggering legend—*Lonicera Maximowiczi Sakhalensis*—Maximowicz's bush honeysuckle from Sakhalin. And why does it bear that Latin name, and who first classified a bush honeysuckle under Lonicera? And who was Maximowicz? And by what tortuous ways and toilsome endeavours did this plant come to this sunny garden from north-east Asia?

Glance once more into the vegetable patch. The plants are lined out in trim rows and the walks are edged with iris and roses. Here the confusion of runner beans is contrasted with the lordly bearing and ruby-purple and coppery-bronze head of iris Ambassadeur. Farther along soft grey young cabbages serve as foil to a low, multi-flowered rose, bearing the name Gloria Mundi. Is your sense of curiosity sufficiently piqued to ask who first thought up this mixed party of plebeian vegetables and aristocratic flowers? Do you wonder by what stages the wild iris of the country-side rose to this superb colouring and size? By what evolution did

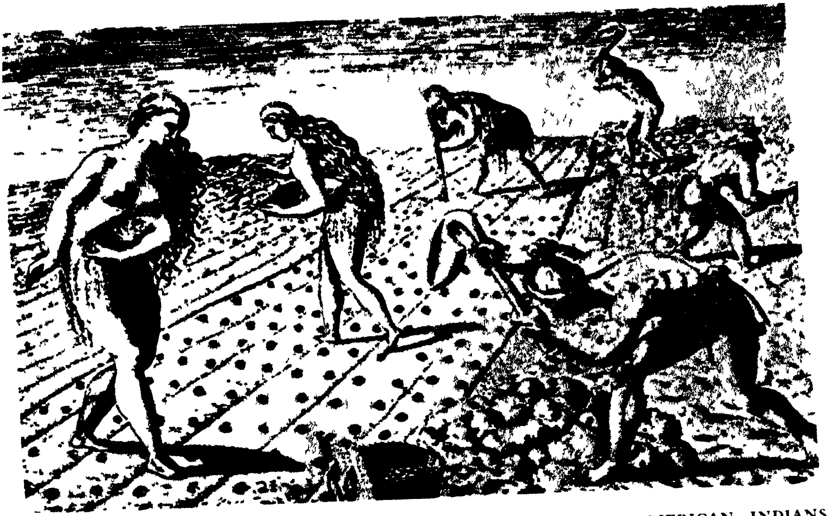
Gloria Mundi acquire its unique tint?

A step beyond and we find ourselves in an upland meadow like those that lie in the hills about the Italian Lakes or around Swiss villages or on the flanks of far-away Tibetan mountains or on the sunny slopes of our own Rockies and Sierra Nevada. Rocks disposed about this corner form miniature pockets of these Alps, and on their ledges and in the tiny moraines blossom flowers so small that you must kneel to enjoy their minute beauty. No such flowers grow wild in the country hereabout. Who, then, conceived the idea of reproducing this Alpine environment and of bringing home these tiny strangers? What lineage has the rock garden managed to accumulate in the past century?

We pass a row of cold frames and beyond them a greenhouse. Is it true, you wonder, that when a great mediæval theologian first raised fruits and flowers under glass in winter, he was threatened with the stake for being bewitched? Even so strange a history do these common garden devices bear.

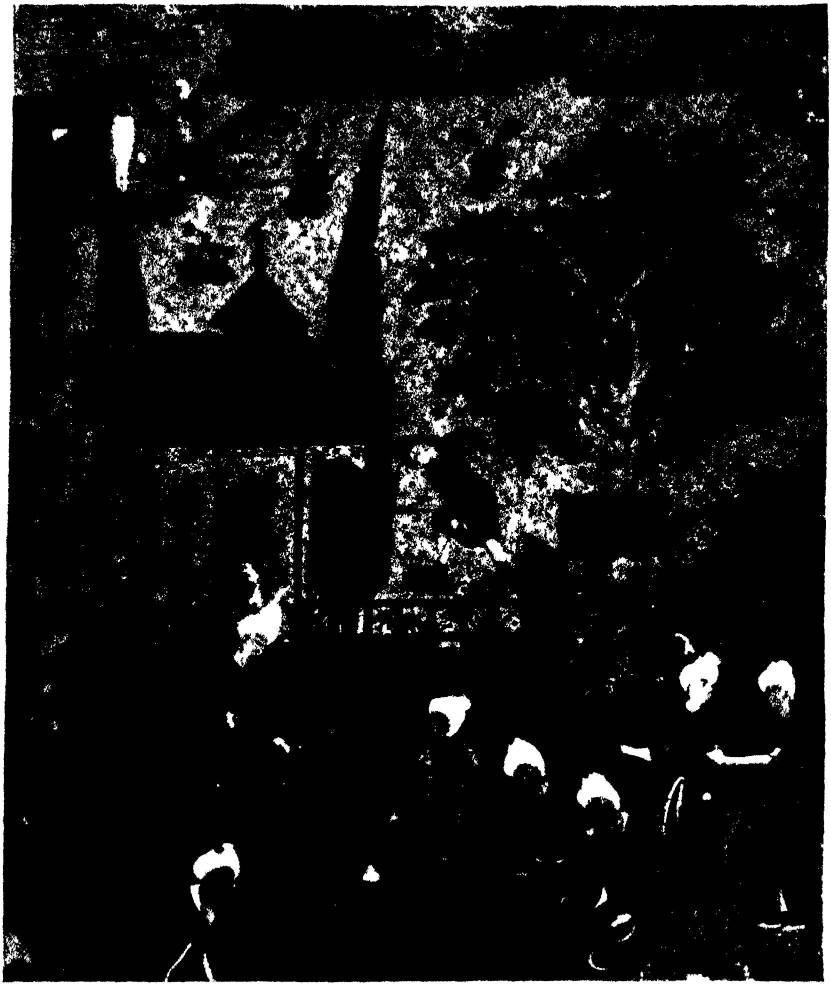
And beyond them, set out in a quaint pattern, grow herbs. Here we are on familiar ground! All old-fashioned gardens had their herb patch. Who can conceive of a gardening grandmother not growing rosemary and dill and anise and thyme? But where, we wonder, did grandmother learn how to grow and use these herbs? Can we see, standing behind her, centuries of men and women in religious habits within monastery walls? Can we see men patiently distilling the essences of these herbs and, beyond that, others venturing into the uncharted sea of healing the sick with them? How far back into the dim past of the race, into the menace of primitive superstition, extends the wayfaring of this herb garden?

From this conjecture, we are roused by the sound of whirring.



IN 1564 LEMOYNE DREW THIS IDYLLIC CONCEPTION OF AMERICAN INDIANS PLANTING CORN

INDIANS IN THE SOUTHWESTERN PART OF THE UNITED STATES STILL GROW PEPPERS IN THESE SUNK BEDS. NOTE THE PRIMITIVE FENCE



IN A 16TH CENTURY PERSIAN GARDEN, A MINIATURE ILLUSTRATING THE POEMS OF NIZAMI AND SHOWING THE CHABUTRAS OR OPEN GARDEN BOWER

On the lawn below, the gardener is now cutting the grass, cropping it close until it is a green carpet. How did gardeners cut grass before the rotary mower was invented? Or didn't gardeners cut grass at one time? Was it all a "flowery mede" and a "daisied down"?

Let us halt, now, where a garden bench offers us comfort. Here we may rest and wonder how all these things began. But even this bench arouses our curiosity. What seats did the Greeks have, if they had any? And did the mistress of a castle sit on a marble bench such as this? Did the Persians, in the gardens of which Omar and Sadhi sang, enjoy these comforts?

The body at rest, the mind may wander where it will. The soft mauves of dusk spread over tree and shrub and flowers. Their divers colours fade and blend. Down the stirring wind come their mingled fragrances, tinctured with the homely incense of brown soil freshly turned. What impulse, other than obvious hunger, led man first to turn that soil, fence in his patch, plant out the flowers and shrubs and trees that delighted his eye, and then at evening rest from his labours, as you and I are resting now, to drink in the perfumes and breathe the peace that comes with the dusk?

The quest for these answers leads us down the winding road that is the Story of Gardening. It reaches vast distances, this road, and into the hearts of ancient peoples in many lands. Passing along it we shall see all forms of gardens emerge, for even primitive gardens contain the germs of our own, and the seed of many a plant flowering in ours today was first sown countless generations ago. Along this road we shall also meet a motley host of men and women, all intent on the same gardening purposes—kings and soldiers and mariners, scientists, explorers, artists, doctors, architects, priests and nuns, humble peasants and lordly rulers, rugged fellows and petulant queens and the shadowy ghosts of gods and goddesses and of shy spirits that haunted hill-tops and dusky forest glades and danced across the gentle slopes of sunlit, rolling meadows long ago.

CHAPTER II

HOW GARDENING BEGAN

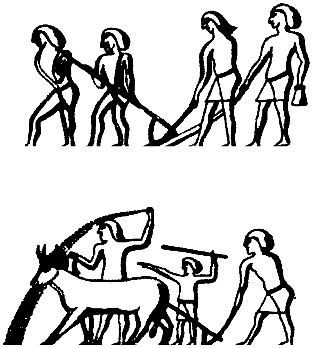
PRIMITIVE man preferred a meat diet. He ate cereals and fruits only when obliged to. Let the chase fail, and his women supplied food from forest and meadow. These husbands were constantly wandering, moving the family from place to place. While they hunted game, the women were weaving and making pots, and grubbing up tubers and gathering wild grains and fruit.

This conscious selection of certain edible plants harboured the first faint pulsation of gardening. And women were thus the first plant explorers.

From his nomadic life, early man settled down by very slow degrees. Wandering is a habit not easily shaken off, and many a reason urged him on. War was one; hunger another; death a third. A death would drive him from any primitive Eden he might fancy, for he had a terror of death and fled the place where it had happened, or where the dead were buried.

When at length he did select one spot for his home, such migrations as he undertook were limited to areas where friendly tribes existed. In the beginning he never had one piece of land he could call his own. Nor did he need to own it. Land was common, and his sole private possessions were his movable objects. Indeed, long after he had settled, the land was held in common with the tribe. Eventually it became private property. When it did, gardening may be said to have ceased being nomadic and the garden to have taken definite form. Not till then could his women folk and children, with any sense of surety take from forest and meadow edible roots and the seeds of wild wheat, barley, millet and rice, dig them into a chosen spot of ground and stir the soil with their sticks to cultivate the plants for a sure harvest. Women were thus proven the first gardeners.

HOEING THE GROUND.



THREE STEPS OF THE EVOLUTION OF THE CROTCHED STICK INTO A PLOUGH

This transferring of wild, selected food plants to a cultivated area was the second step in gardening and, incidentally, the beginning of civilization, for civilization began when man found that he could make sure of a plentiful supply of food by planting seeds.

The next step was the thinking of tomorrow, and the storing of the surplus grain of this season against the lean months ahead. Women, again, doubtless first did this planning, for they sowed, cultivated, and reaped, and it is natural to suppose that they also stored away in safe and secret places such meagre harvests as could be spared. Thus hidden, they were safe from the raids of famished and less provident men-folks.

The reconnoitring party sent out by the Mayflower before it landed the Pilgrims on the Massachusetts shore found just such a primitive harvest cache. In a deep hole lay baskets of corn and

THE MEDIÆVAL MAY TREE WAS AN OUTGROWTH OF THE PRIMITIVE TREE OF LIFE

beans wrapped in rush mats and covered with earth. The pious fathers debated over taking some of that corn and finally decided it to be the will of Providence that they should appropriate ten bushels. So the first planting made in New England included twenty acres sown with corn pilfered from the Red Man's primitive harvest store. To their credit it must be said, however, that at the end of the season the Pilgrims returned an equal amount of seed corn and beans.

Whether it was a patch in the heart of Africa or a patch in the wilds of the Atlantic seaboard, the cultivated area had to be fenced in to prevent its destruction by wild animals, to keep domestic animals from straying too far, and to mark out the bounds of the property. A hedge of thorny bushes or tree limbs thrust into the ground and woven together with pliant vines into wattles formed the simplest and, perhaps, the earliest kind of fence. Wattles are still used in England, and the thorn or cactus hedge is a commonplace in many lands to this day. Old Testament times knew it well, for the Wise Man advised, "Look that thou hedge thy possessions about with thorns . . . for where no hedge is, there the possession is spoiled." We may conclude, then, that the oldest garden adjunct is the fence, and the oldest kind of garden a fenced vegetable patch.

The primitive American Indian's methods of agriculture, like many another's, also passed through successive stages. First he sowed seed broadcast. Next he planted the maize in mounds or hills—a custom we follow to this day; and, to enrich the soil, in each mound he placed a fish, just as we fling in a handful of fertilizer. The third step was planting in orderly rows, which made cultivation easier. The modern vegetable garden, with its orderly, fertilized and readily cultivated drills, is lineal descendant of that primitive garden.

Primitive Tools and Garden Design

So also are the tools we use in it. The early tribeswoman used a digging stick—a sharpened length of branch, with which she dug and replanted wild roots. Then she took to scratching the soil, or cultivating it, with a stick that had a hook or shortened crotch. This crotch eventually grew into a blade when metals began to be used—and there we have the hoe! Or maybe she made a hoe, as the Rhode Island Indians did, by lashing a clam shell or the shoulder blade of a deer to a stick. This hoe was enough of a tool to heap up mounds, but when those mounds were in straight lines, the hoe's blade was lengthened and a cross-bar thrust through its handle. A man could then drag it and plough the soil. Eventually two men dragged it, and finally oxen were hitched to it and it was guided by handles. Our own generation, having dispensed with oxen and horses, now draws the plough with a gasoline engine. Thus the digging stick attains its apotheosis.

But long before this, when the digging stick became a two-man plough, home gardening had expanded beyond the enclosed area to wider fields and had become agriculture. The plough made agriculture possible.

Since water is necessary to the life of man, cattle and plants, the spring or water-hole was either protected separately or the fenced-in area was extended to include it. From this grew the garden pool. Direct paths led to this water-hole, paths that divided the patch into plots. It requires no great stretch of the imagination to see the evolution of this useful primitive scheme into the formal decorative arrangement of a pool and paths characteristic of the great gardens of France and Italy.

VERY EARLY DID TOOLS TAKE THE FORMS THEY HAVE TODAY

While the acquiring of food and drink was the first urge that gave birth to the garden and its form and the tools used in it, by no means did primitive man make a conscious artistic striving toward beauty in his garden's shape, or experience any outbursts of artistic gardening energy. His first garden was a garden of necessity. When he had accumulated sufficient foodstuffs and acquired some leisure and had fashioned himself a home, he began to make a garden for enjoyment. He then gradually learned to create beauty out of his necessities. The home and the architecture of the home came first, or, as Bacon has put it in his essay, "men come to build stately sooner than to garden finely."

Early man, having attained this leisure and fashioned some sort of shelter, made a garden around it that took a mathematical or formal shape. With this he challenged the shapelessness and jumbled growth of the wilderness. Indeed, it was only after he became highly sophisticated that man copied Nature. For this there is a reason.

The depths of the forest and the endless expanse of the plain held many a terror for him. There dwelt those unseen forces that swept his home with fierce destruction—wild animals, winds, lightning, torrential rains, flood, fire and the sinister heaving of the ground in earthquakes. Against them stood his garden hedge, a meagre barrier to be sure, but a line beyond which he hoped they could not pass. The form of his garden was instinctively calculated to banish the terrors of that wilderness from his mind. Even so early was the garden a haven of peace.

The gods, nevertheless, took little heed of man's frantic litanies. These forces did pass that barrier and sweep down on his home, and he needs must propitiate the wrathful spirits that he believed propelled them. By sacrifices and proper awe, the gods of the forces that gave life and brought annihilation could be cajoled into good behaviour. Because certain spirits he believed to dwell in trees, those trees he held in awe. To this day the Negro natives of Jamaica carry lanterns at night, not so much to show them the path, which they know full well, as to keep off Duppy, who dwells in cotton-trees.

The worship of trees was apparently among the first forms of religion. The Tree of Life is found in all of them. Behind it stretches a simple reasoning. Although Nature on all sides may have been abundant and fecund, starvation was a constant menace. Consequently there arose the worship of fertility, with its long train of mother gods that extends down even to our own day. To primitive people fertility was symbolized by a tree, the noblest and longest lasting product of Nature they knew. The Tree of Life thus became both an object of worship and a feature in gardens, eventually to be elaborated into many magnificent and costly forms. To the Hindu the tree stood as a symbol of knowledge, to the Persian an emblem of immortality. The early Hebrews, however, forgetful that the Garden of Eden contained the Tree of Life as well as the Tree of the Knowledge of Good and Evil, concentrated on the latter, so that to them the tree was a symbol of temptation. While we of today may not believe that spirits dwell in the branches of trees or that their rustling leaves whisper oracles, yet our appreciation of their green felicity and usefulness is akin to that which made primitive man bow down to them and worship them.

The Start of Priest and Doctor

In vivaciously eating this plant and that, primitive man discovered that some plants agreed with him and some did not; some brought him strength and exhilaration, and some, death. Thus did he grope toward an appreciation of the properties of many wild plants, and he introduced them into his garden that they might serve his needs. But he kept one eye on the gods while he was doing it. Healing he considered a gift of the gods, since he held that they possessed a knowledge of plants. Indeed, the very substance of plants was a bodily part of the gods themselves; when he ate of these herbs, he ate of his divinities. If they were good gods, the plants benefited him; when they poisoned him, they were the products of evil spirits.

This superstition left a wide gate open for magic and magicians to enter. Magic gave man the power to overcome the gods, to impose his will on them. Gradually the cannier of these magicians began studying plants and, by their specifics, which were accompanied by incantations and divinations that did as much to kill or cure as the herbs themselves, they acquired a reputation as healers of mankind's ills. In time these healers became shaymen or priests, and they jealously nursed the notion that the gods had deputed to them alone the knowledge of the properties of plants. Naturally, they gained a powerful grip on the lives of their fellows.

These crude students of healing herbs gave rise to the two great professions of the priest and the physician. The priest enjoyed his control through fear and protected it with increasing superstitions. The medicine man groped his way toward correlating cause and effect. He began dimly to realize that sickness and disease sprang from natural causes and not from the activities of devils.

But for a long time the lay medical practitioner or physician was subservient to the priest. When he made a sick call he carried his magician's wand and was accompanied by an exorcist and a reader of omens to whom he was subordinate. Many generations passed before he dared to walk alone. Even then, he continued carrying his magician's wand with a snake curled round it to symbolize his power of reviving the dead. To this day the caduceus is the symbol of the physician.

Since his studies led him away from superstition, the lay doctor eventually began taking a different path from the reader of omens and the exorcist—and the first call to battle between science and religion was sounded. However wide apart their ways finally travelled, we are interested in them because both—the physician especially—contributed to mankind's understanding of the plants that grew about him.

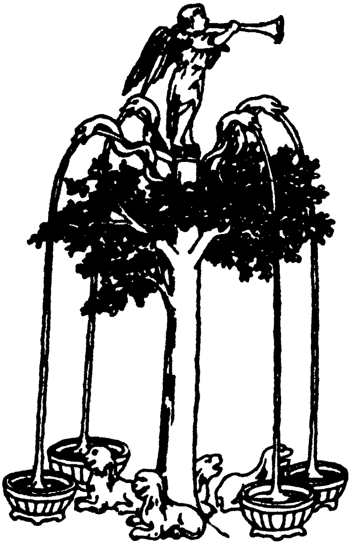
Down through the ages, however, the priest clung to his early vocation as healer of men's bodies. In Babylon, in Egypt, in Greece, the care of the sick was his sacred prerogative. This priest-physician would don a disguise to appear as the god of healing when he called on his patients. Groups of these priests lived in medical temples. Their descendant was the mediæval monastery, which served as the repository of the knowledge of healing herbs, and of which the herb garden was a necessary and well-tended part.

With the spread of Christianity and the decline of the Roman Empire, there came a slackening of intellectual effort, accompanied by the rise of miraculous cures and a corresponding decay of rational medicine. The priest-physician gained control of healing and used all the old devices of cures by relics, incantations and anointings that were the practices of primitive shaymen. Scientific medicine soon was classed with heresy and only heretics and Jews dared pursue it. Nevertheless they were the only actual physicians during the Dark Ages in Europe. The Renaissance and the Reformation saw the knowledge and practice of medicine once more pass definitely into the hands of physicians and scientists.

The garden of both the priest-physician and the lay medical practitioner was a physic garden, a garden specializing in plants from which medicines could be concocted. And it was the first of all specialized gardens. Although the Greeks and early Romans grew plants of a kind in separate beds, and the Old Testament, too, furnishes strict injunctions regarding this practice, the physic garden was the lineal ancestor of specialized gardens as we know them today—the Rose Garden, the Rockery, the Water Garden and the Herb Garden, each devoted to its own plant families and cultural purposes.

Statues, Pools and Fountains

His fear of the phenomena of the natural world, zealously supported by the priest, induced primitive man to create images of those natural forces for the purposes of worship and propitiation by sacrifice. He copied the familiar forms of human beings and animals. He set them around his house and in his garden. Increasing skill of artistic expression eventually lent these statues great beauty of line and form. They became garden features even in the early times of Egypt, Assyria, Greece and Rome, so that the gardener was always surrounded by reminders of his deities and the ancient traditions of his country. The garden statue of today—even the ubiquitous naked small boy struggling with a fish—is their contemporary heir.


A BYZANTINE TREE FOUNTAIN

Return once more to that protected water-hole or spring in the midst of the thorn-walled patch. From it was carried water in gourds or earthenware pots to refresh thirsty plants in times of drought. If the garden lay near a stream, a simple channel diverted water into it, and from this main conduit the water was conducted along the cultivated rows. Here began irrigation—the same sort which the Egyptians raised to splendid engineering feats and the California fruit grower today employs in the ordinary course of his work.

These methods of garden watering at length came to be subjects for beautification. The open irrigation trench, tiled and made part of a garden pattern, was refined into the water canal, a device common to Saracen gardens and found in many a garden design today.

Since water cooled the air and its music was pleasant to the ear, a feature was made of it—its entrance into the enclosed garden was marked by a decorative spout, which is ancestor of the wall fountain. In the middle of the garden other jets threw their refreshing sprays on the sultry air. From this necessity grew the decorative fountain that is found in every type of garden known to man. On it the world's artists have lavished their finest skill. Its history is a notable branch of the genealogy of art.

Effects of Primitive Gardening

Horticulture, and its offspring, agriculture, as we have seen, were established practices long before the dawn of recorded history. They assured a dependable food supply. They preceded the attainment of any higher culture. But from them the steps upward were slow. In that gradual evolution we may trace several important matters: a new reason for possession of land and for wars fought to assure that possession; the increase of population; the beginnings of commerce; and the migrations of plants that have their effect upon the kinds of gardens even that we are making today.

Wars were first fought for the possession of hunting areas—

those where game was plentiful. When primitive man went into agriculture, he found certain areas better than others for the production of crops and the pasturing of his flocks, and he laid claim to these areas and fought to protect his occupation of them. Thus the herdsmen of Abraham's cattle and the herdsmen of Lot fought because, their cattle being many, "the land was not able to bear them."

Agriculture also made possible the feeding of a larger population. Sir Arthur Keith estimates that if "a tribe of fifty souls depends for its livelihood on the natural products of soil and river, it needs one hundred square miles of fertile territory." If it cultivates only one one-hundredth part of it, it will quadruple its numbers, whereas the surrounding hunting tribes, living up to the limits of available food, remain stationary. "The agricultural tribe not only gains in numbers, strength and security, but finds it possible to remain in one locality, to build permanent shelters and to establish settled communities—thus making arts and crafts possible."

Just as he domesticized the animals nearest at hand which he found in the neighbourhood of his dwelling, so did primitive man first select and grow the plants native to his locality. The development of both these plant and animal forms to the higher types we know paralleled many of the phases of the evolution of mankind.

On the other hand, the wandering of these basic food plants, from their native heaths to the four corners of the world, not only often outlines the history of early migrations but serves as a verification as to their age and as to the development of commerce. In time it also exerted pronounced influence on the shapes and kinds of gardens.

Some plants primitive man took along with him on his wanderings; the seeds of many travelled incidentally on his clothes and goods and in the wool and hair of his animals. Thus, in the beginning, many plant migrations may be said to have paralleled tribal migrations. Having acquired a store of desirable plants and found them to be profitable articles of barter, men began carrying plants and grains from one section to another—no doubt the first steps of commerce.

New plants were also brought home in the booty of conquerors returning to their native lands. When the age of exploration dawned, plants and a knowledge of the flora of new parts became essential items in the cargoes of returning adventurers. Within the past two centuries, scientists have deliberately set out in search of new plants. This travelling botanist is now known as a plant explorer and he brings back from hinterland fastnesses unusual trees, shrubs, perennial herbs and bulbs that, duly acclimatized, become features of the garden landscape. "Chinese" Wilson (*bonae memoriae*), stumbling down a Tibetan mountain flank with his load of Regal lily bulbs, and Reginald Farrer, homing to England with his precious cargo of primulas, were merely higher expressions, through centuries of botanists and intrepid scientific explorers, of such a plant collector as Tiglath Pileser I, who, eleven centuries before Christ, brought from his foreign campaigns the strange trees and shrubs with which he made his reputed botanic garden in Nineveh. And Tiglath, in his turn, showed a high quality of the same discernment that caused primitive man to ship his plants and plant products for barter.

Early civilizations soon found themselves depending on the products of these alien plants—the fruits, spices, medicines and dyes. If they could not be grown at home, they must be imported. In supplying this demand, commerce was developed. Myrrh and frankincense, needed for the smoking altars of Babylon, aloes and cinnamon, to perfume the house and the person and to embalm the dead, were contributing factors in the development of the Phoenician trade with the Far East, in return for which men of Babylon and Assyria bartered their native produce.

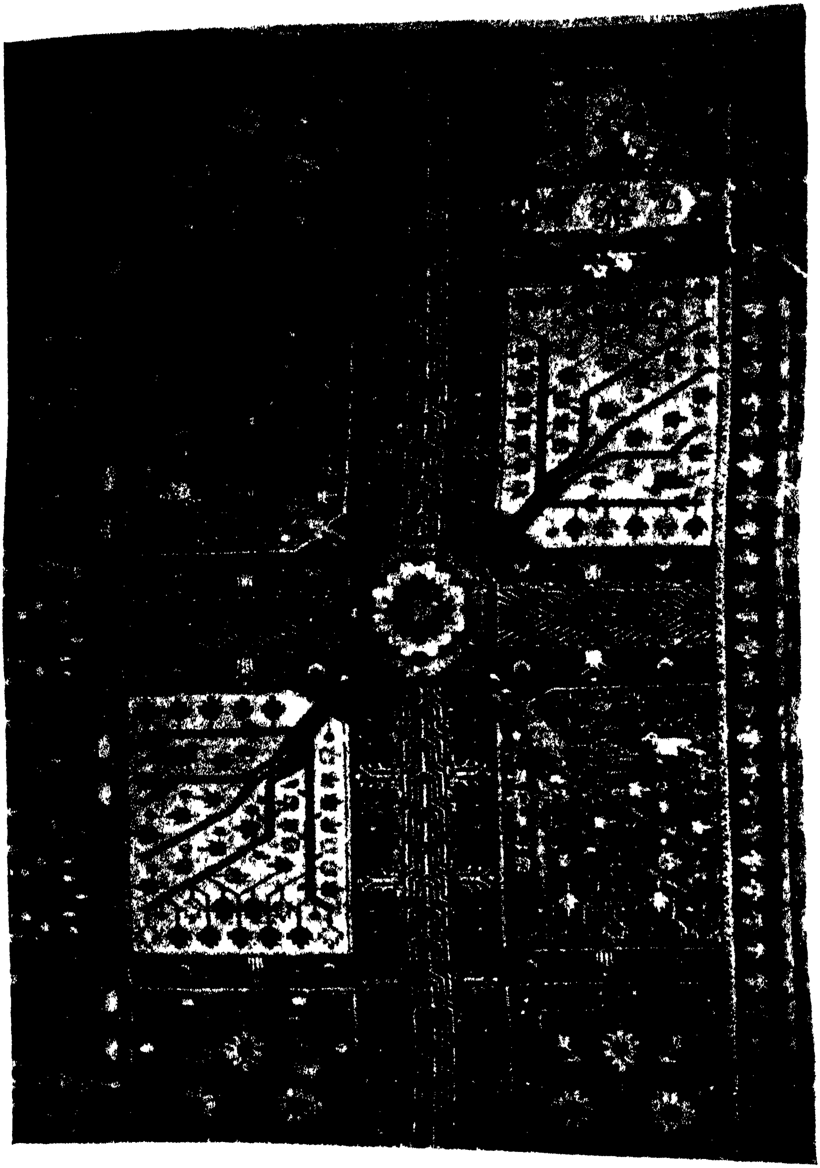
In the course of this interchange were introduced many plants not native to the respective countries or not as yet found in them. Their culture eventually had its effect on the kinds of gardens made to accommodate them.

Whereas the first acclimatizing of new plants followed crude and often unsuccessful ways, today we give them the nearest approach we can create to their native environments. Daffodils, naturalized in grass, the rock garden that is a small section of Alpine terrain, brook banks planted to rare and unusual water-loving species, are all the result of this modern method of reproducing native habitats. No influence has operated more effectively than this in giving our gardens the variety of appeal that makes both their cultivation and their contemplation pastimes of such absorbing interest.

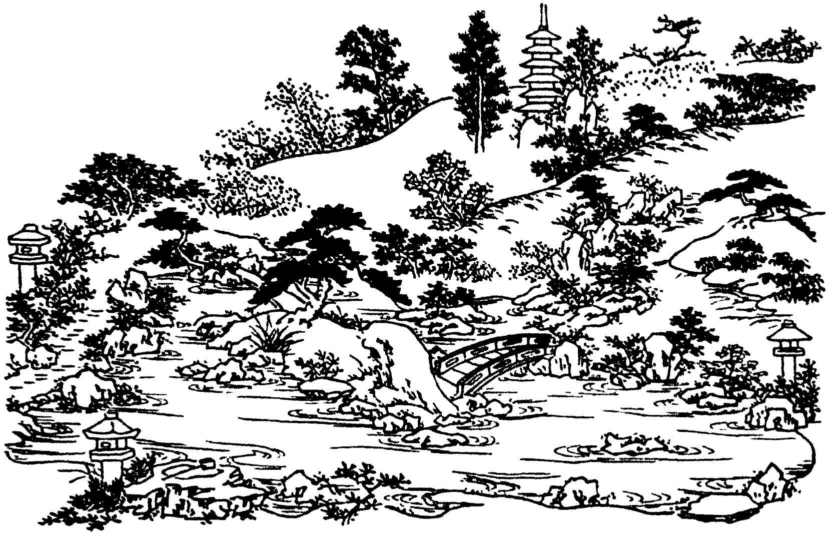
The Four Great Gardening Highways

Thus we see that gardens and gardening methods become essential pages in all great social documents. They indicate eras and mark the evolutions of peoples. Consequently, in further tracing this Story of Gardening, we must travel along the same four great roads that primitive man pursued to attain culture. These four were the West Asian, the Hellenic, the Hindu and the Chinese. At times these highways run parallel, at times intersect, at times merge into each other.

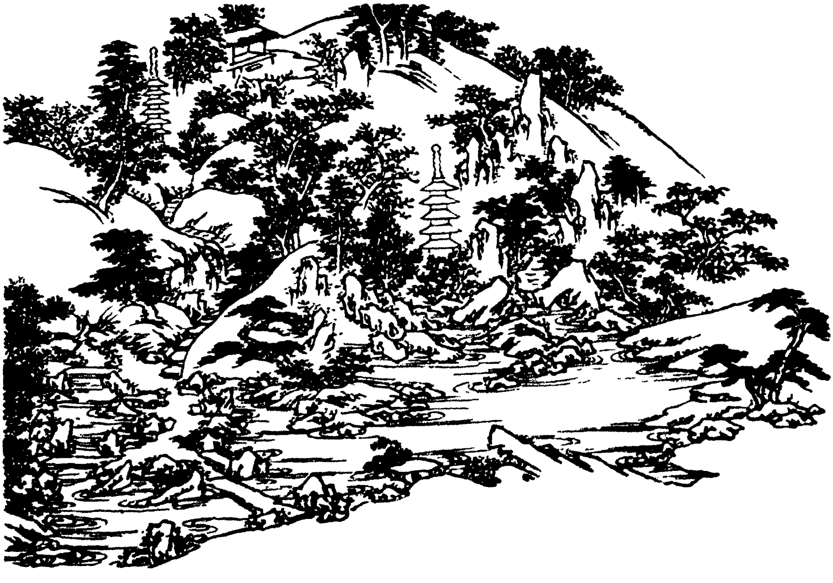
Hellenic culture is that which grew up in the peninsula and islands of the Mediterranean between Europe and Asia. It eventu-



A PERSIAN CARPET OF THE 18TH CENTURY ON WHICH A GARDEN IS PICTURED.
FROM THE METROPOLITAN MUSEUM OF ART



GARDEN OF JOJIU-IN, AT KIYOMIZU, WITH DETAILS OF ORNAMENTAL LANTERNS, BRIDGE AND PAGODA USED IN OLD JAPANESE GARDENS



A GARDEN AT MARUYAMA, WITH THE SYMBOLIC STONES. BOTH ILLUSTRATIONS ARE FROM "LANDSCAPE GARDENING IN JAPAN" BY JOSIAH CONDER ally passed to Rome and from Rome spread over Europe and thence to America. Whatever its ramifications, the original civilization of Western Europe was Greek.

Equally far-reaching was the highway of Chinese civilization and in a sense, it paralleled Rome. When Rome began fighting its Punic Wars, China was a mere handful of petty states in the north. As Rome expanded, so did China—first south of the Yangtze, then north-east to Korea, thence north-west to Mongolia and beyond the Pamir watershed. While Christianity was gaining its foothold in Rome, there was spreading over China the religion of Buddha, which had its origin in India. Christianity in time became a state religion, but Buddhism never succeeded in overthrowing the existing Confucianism and had to be content with being, together with Taoism and Confucianism, one of the "three doctrines" of China. It served an important purpose, however, in that it was the carrier of Chinese civilization to the hinterlands of the Orient.

The path of Hindu culture started in India and spread by side roads to Ceylon and the islands of what are now the Straits Settlements, to Burma, Siam, Tibet and Outer Mongolia and, in Zen Buddhism, to Japan. It demonstrates how primitive civilization and religion were intermingled and how gardens in the beginning and for many centuries thereafter were expressions of religious beliefs.

In Asia and Africa, to the east and south of Greece, there developed a civilization so firmly entrenched that Greek culture failed to supersede it. Even when Alexander the Great subdued much of that vast area, the Hellenism he superimposed lay on those countries like a light snow, soon to disappear before the warmth of existing culture and native traditions. That existing culture was the West Asian, which had its origins in Sumeria and Egypt, whence it was carried and spread by Semitic and Iranian peoples.

Down this West Asian road we are now prepared to turn our steps.

CHAPTER III

DOWN THE WEST ASIAN ROAD

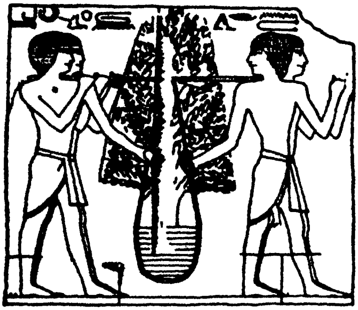
Beside Sumerian Canals

IN what particular corner of south-western Asia did the gardening civilization arise? We can only surmise. The yeasty clouds that lie over those forgotten hollows rarely part, and only for fragmentary glimpses.

The Euphrates Valley with its delta was supporting a pastoral and agricultural people in 3500 B. C. These Sumerians must have had carefully irrigated fields, for they introduced a canal system that drained marshes and controlled the water flow of rivers. Along the canal banks they planted onions and in the meadows between they raised barley. They also had extensive date orchards. Land was donated to temples. The king and the ruling classes improved their estates. Outlying farms and the tracts set aside for ex-soldiers were cultivated under strict laws. The plough was used. Local values were reckoned in measures of barley. The average inhabitant's diet was vegetarian. Their houses were first made of reed mats propped up on sticks, and later were built in rectangular form of sun-baked brick.

Although the Sumerians were doubtless the first systematic agriculturists, of the gardens they made around their cities on the Chaldean plains five thousand years ago we know very little.

Flowers appear to have been used for ceremonial head-dresses. The people, having come originally from the hills, erected their temples on high mounds of artificially heaped earth called *ziggurats,* not unlike Aztec temples. Trees were grown on the slopes and the land about the temples must have been planted to food-bearing crops, because each sacred grove housed a large company of priests and attendants. Distant relatives of this temple on an artificial hill were the garden house on an artificial mound in Tudor and 17th century Continental gardens, and the Green Hill that Marco Polo found in far Cathay. Also there is mention of a pool in one of the king's estates, a pool with a turf rim quite like those found in many a garden today.


EGYPTIANS TRANSPLANTING TREES

The kings must have been interested in agriculture because the first example of a royal gardener dates from this period. Sargon I, who founded the ancient Akkadian Sumerian Empire, a thousand years before Moses, claims to have been discovered, like the prophet, in a reed basket. The inscription says: "The river bore me away and bore me to Akki, the irrigator. Akki, the irrigator, received me in the goodness of his heart. Akki, the irrigator, reared me to boyhood. Akki, the irrigator, made me a gardener. My service as a gardener was pleasing to Istar and I became King."

The most important fact about this Sumerian culture was that it bred others. It spread up the Euphrates and Tigris valleys, it obtained a foothold in Syria and penetrated eastward in Asia. On its laws was built the code of Babylon, and on its civilization, the civilization of early Egypt. And it is when we come to Egypt that gardens begin to assume definition.

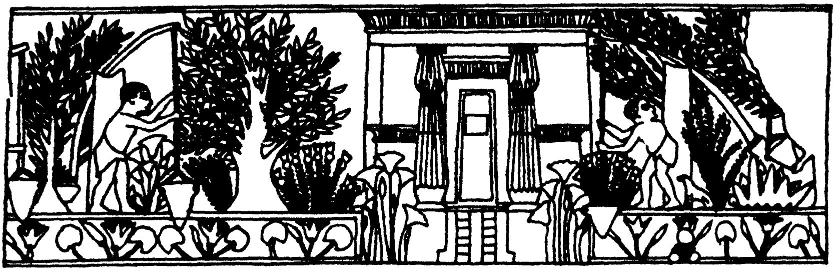
Egyptian Home and Temple Gardens

The nature of the Nile Valley dictated not alone the methods of gardening in Egypt, but also suggested the architecture of houses and temples around which gardens were planted. Picture this valley: a long stretch of flat land; on its borders mountains rear their perpendicular cliffs and through the heart of it, a great artery pulsating with the life blood of a people, flows the Nile, now a stream placid between low banks, and again a surging torrent sweeping over those banks to bring water to the parched fields. The control and conservation of this water was one of Egypt's most valuable contributions to garden practice. Egypt gave the world its first recorded methods of hydraulic engineering and systematic irrigation.

From level to level the water was raised by hand-operated buckets or well-sweeps called *shadufs,* and by Archimedean screws (the water-wheel with a chain of buckets not coming in till Roman times), and fed to the crops through sluices in the banked terraces that impounded it. A man could then, literally, as the Old Testament says, water his garden with his foot—by kicking a hole in the dike.

Of course, some rain fell in Egypt. The vicinity of Thebes had occasional light showers and Alexandria enjoyed frequent rains. It was to Upper Egypt, where no rain fell, that irrigation brought its greatest benefits. And when these floods were beneficial, the people would say that they had a "good Nile." The Nile began to rise early in July and steadily increased till the High Nile festival on August 22nd, when the canals were opened. The peak water continued till the middle of October, after which it subsided rapidly. By early November the crops were sown. While they were growing along, farmers trimmed their trees and vines, and then, by April and May, would harvest the crops.

The rich silt left by these floods was splendid soil for crops. Well was Egypt named "the land of the black earth." In it the older dynasties cultivated their sycamore figs, which gave both fruit and wood, their date palms, acacias and tamarisks. By the 4th and 5th dynasties, and in the Middle Period, not only was the cultivation of these plants raised to a high art, as proved by contemporary tablets and carvings, but many more varieties were added.



IN A GARDEN AT THEBES, SHOWING GARDENERS WATERING THE PLANTS

The growing of grapes and the making of wine pales back into the dim past of 6000 years ago. Records of grape cultivation and the making of wine appear on the tomb of Ptah-Hotep, who lived in Memphis 4000 B. C. At first the grape-vine was allowed to sprawl on the ground; next it was raised on little props, then on posts, and eventually these posts took on the semblance of the arbour and pergola we know today. Indeed the pergola is one of the oldest forms of garden decoration. The round arbour was a favourite pattern with Egyptians. These shady vineyards became the centre of garden interest and they were used for summer living rooms. In the great hall of pillars at Amarna the pergola is represented by a vine-covered roof.

The vegetables and fruits cultivated in early Egypt included lentils and onions—which formed the main diet of the populace—chicory, melons, watermelons, radishes, dates, figs, bananas, lemons and pomegranates. They raised the castor-oil plant to furnish medicinal oil, flax for linen, and from the Lawsonia they obtained henna to dye their finger nails. From the date palm they obtained food, and with its fibre made baskets and ropes. The Aleppo pine gave a resin for embalming. The juice of the pomegranate they fermented for a wine and its rind served them for a vermifuge. The papyrus, eventually brought from its native marshes in the Soudan, provided paper, and the poor cooked its rhizomes for food, or made them into charcoal. They ate seeds of the white lotus, and used the flowers for house decoration and the adornment of their persons.

Traders and conquering kings on their return home were accustomed to bring back new trees and shrubs from other countries. By these means was the indigenous plant material increased and a wide variety of interest given to the gardens.

What kind of gardens did the Egyptians make with these plants? The ancient records show two kinds that have bearing on the evolution of garden design—the temple garden and the estates of officials.

In Upper and Lower Egypt were forty-two districts, each with its temple surrounded by a sacred grove. Kings and wealthy citizens endowed these temples with land, so that the ecclesiastical acreage was often extensive. Rameses gave no less than five hundred and fourteen tree and garden sites to temples. The priestly lands were cultivated entirely by serfs. In a sense, these groves were tree sanctuaries, for in this land, where trees were scarce, trees were everywhere held in veneration. Each temple had its particular kind of tree sacred to its divinity—its Tree of Life—and cultivated that tree sometimes to the exclusion of others. As in later ages monasteries were the depositories of learning, so these temple groves, these early arboretums, were depositories of trees and the source of knowledge of them. In the Metropolitan Museum of Art is a model of a garden dating from 2000 B. C. which shows the immediate area enclosed with a high wall and trees disposed at regular intervals in front of the portico and around a pool.

It is reasonable to believe that part of the ground surrounding temples was also given over to growing herbs used in concocting drugs. To the temples—especially those in Lower Egypt—students flocked for their medical education, and the sick and ailing came for cures, much as we go to spas today. Official schools of herbalists existed as early as 3000 B. C. For a long time Egyptian medicine was controlled by priests, who mixed with their specifics a generous quantity of superstition and esoteric lore. The greatest among them was Imhotep, a priest-physician of 2700 B. C., who also served as architect of the Sakkarah Pyramid, near which was discovered his tomb. Twenty-five hundred years after his death Imhotep was still the subject of a widespread cult. He became the deity of medicine, and several temples—the principal one being at Memphis—were erected in his honour.

In the fourth book of the Odyssey, Homer says, "In Egypt the men are more skilled in medicine than any of human kind." Herodotus states that Egyptian medical practice had its specialists, just as we have them today. These facts are well attested by several of the papyri, some dating from as early as 1800 B. C. It has been estimated that five-sixths of the drugs named in these compilations were of vegetable origin. In one of these papyri, a product of Egypt's highest civilization, a priest compiled some seven hundred medical remedies, in the making of which specifics were used acacia pods, aloes, caraway seed, colchicum, castor oil, dill, elderberry, gentian, lettuce, lotus flower, mint, myrrh, pomegranate root, poppy and squills. Though a number of these ingredients were imported, many were raised locally, so that the sacred groves in which they were grown can well be set down as the ancient ancestor of the monastic herb gardens of mediæval times.

Both temple and private gardens were located on such hills as could be commanded, above the flood line of the Nile, and often the hill-side was terraced. Almost invariably the garden was enclosed with a high wall. Apparently the Egyptian was not so anxious to contemplate the distant view; one scene was enough for him, and that scene his own making. Again and again we find this walled garden—sometimes for protection against trespassers and many times to exclude the ugliness and confusion of the outside world. The Egyptian had the good sense to take shelter from the realities of life behind a garden wall.

Within those walls the man of means laid out his garden with the same formality that his house displayed. It was a garden of straight lines and systematic planting—a checker-board garden which, of course, is the easiest kind to irrigate. Several plans of these private gardens have come down to us. One of the most comprehensive is pictured in a tomb at Thebes and shows the garden of an official under Amenophis III, made about 1500 B. C. A large entrance gate is flanked by side wickets. A shady avenue of trees runs around the outside of the wall and beyond that a canal. Between the entrance gate and the house is a vineyard of arched arbours. A main path leads to the house with two side paths extending from it to the arboured sections. Low walls divide the garden into eight parts of different sizes. Two small pavilions are fronted with flower beds and grass-rimmed rectangular ponds in which ducks disport themselves and lotus is growing. Two similar ponds are near the front gate. The intervening space is filled with plantations of trees, fenced in, and around the inside of the wall are two more avenues of trees marked off by a low wall.

In other estates we find the house built as part of the roadside wall, with ponds near the gate, kiosks and beds of flowers. There were shrines in these gardens. Single trees were often planted with a little dike around them to hold water, and often there was an underground watering system for them, not unlike the method used for flushing the streets of Paris whereby street-side trees are also irrigated. This custom of tree irrigation the Egyptians passed on to the Moors, who, as we shall later see, took it to Spain. Sometimes trees were planted formally around the pool. If the soil proved poor, rich silt was hauled up from the Nile banks.

AN EARLY EGYPTIAN FRUIT ARBOUR

Some of the gardens had beds of cornflowers, poppies and papyrus planted in colour blocks, which was a taste natural to a people such as the Egyptians, whose colour sense was highly developed. One wonders if these beds of solid flower-colour could be the ancient progenitor of "carpet bedding," that custom in which our grandparents took such pride and delight. For ease of cultivation vegetables appear to have been grown in straight rows. The fruit tree was found in abundance. Another custom familiar to us was the Egyptian way of growing flowers and shrubs in pots or wooden boxes placed along the walks near the house. Bees, of course, were considered a necessary adjunct, since the Egyptians had no sugar, and they used honey for sweetening their food and drinks.

The most pronounced feature of these Egyptian gardens, however, was the pool. Some were rectangular, some T-shaped. Amenhotep III built for his wife a pond nearly a mile long and nearly 1000 feet wide—large enough for boating!

Many of these estates employed a large staff. Seti II had twenty-one gardeners, men, women and children, whose business it was not alone to keep the place in good cultivation but also to make the garlands used in worship and festivities. Did these garland-makers have competitions in "artistic displays" such as our ladies indulge in at garden shows? Gardeners were held in good repute—the head gardener of the pyramid of King Pepi I was honoured with a statue when the pyramid was built.

Not alone the rich and influential, but the poor man also had his garden and his shady grove in which to rest from the insistent, tyrannous heat of the sun. All ranks of Egyptians loved gardens and flowers, as their poetry, papyri, grave wreaths and pictured tablets attest. In the course of the hundreds of years that marked their civilization they made many contributions to gardening. Although they could never acclimate the cedar, they did learn how to transplant trees successfully. One of the carvings at the Temple of El-Der-El-Bachri shows four sailors bearing a tree, of which the ball of roots is wrapped in a basket as carefully as any nurseryman ships a tree today. Conquests and commerce brought them countless additions to their gardens. To the temple of Amon, Queen Hatshepsut, or Misaphis, caused to be transplanted thirty-one specimens of incense-bearing trees, part of the booty of an expedition against Somaliland or Punt. These were probably Luban trees—*Boswellia thurifera*—which exude a gum that, when dried, is frankincense. In one of the halls at Karnak another ruler, Thothmes III, records the flowers, trees and animals he brought back as loot from a Syrian campaign.

There is evidence, too, that these Egyptians fell into the temptation of clipping their trees into spherical or columnar shapes, an early indication of topiary work which the Romans were to bring to a high degree of nonsense and which is still found in old cottage gardens in England.

Among the imported flowers that Egyptians came to love was the rose, and in its days Egypt was the rose-supplying nation of the Mediterranean. It shipped roses to Rome, although no one has yet discovered the secret of how they were kept fresh during that long journey. In addition to the rose, Pharaoh's reign saw anemones, poppies, thistles, reeds, chrysanthemums and cornflowers introduced as "novelties" into gardens.

This marked love for flowers, in time made its impression on both architectural forms and the interior decoration of the Egyptian home. The walls of the bedroom of Amenhotep IV were painted with flowers, and the floor was made to simulate a lily pool with its flower beds, from which sprang flower stalks that formed the pillars of the room. The tomb of Sen-nofer, garden overseer at Thebes, was made to resemble a vine arbour. Three distinct types of columns were evolved from flowers: the palm column, which had a smooth shaft and a capital of nine palm leaves; the lotus, with the stem for shaft and the flower and date palm leaves for capital, a type found at Philae; and the papyrus at Luxor, a bundle of the stems, that made the fluting, with a single flower opened or closed for capital. It is believed that these flower columns were first evolved from the custom of nailing palm leaves and papyrus flowers to the tops of walls and posts in primitive temples on fête days. The Greeks, learning this custom of floral architecture from Egypt, carried it on into some of the columnar decorations we employ today. By 450 B. C. Callimachus had established the Corinthian order.*

Cut flowers the housewife used to perfume and adorn the rooms of her home, just as we use them, and in the event of death she sent them as tributes of her friendship. No less than twenty species of plants have been recognized in the funeral wreaths that have survived—myrtle, laurel, mignonette, narcissus, ivy, poppy, olive and willow leaves, wild celery, cornflower, mandrake and lilies among them, together with various berries. So carefully and precisely were these funeral wreaths fashioned that they are believed to have been produced by a specialized trade group of chaplet-makers. Flowers, indeed, were essential to the every-day life of the Egyptians. It was the proud boast of one of the Rameses that he supplied the temples with no less than nineteen million nosegays!

A land so rich as Egypt offered constant temptation to its neighbours. In turn it was invaded by Persians, Macedonians, Romans, Arabs and Turks. Each laid over it the veneer of their customs and each spread and absorbed some of its civilization. Every ship that nosed out of the Alexandria wharfs carried some grain of influence to the ports it touched. To Greece they bore the knowledge of husbandry and to many another people—Assyrians, Babylonians and Armenians—this influence extended.

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* An American order of architecture, taking the designs for its capitals from Indian corn, cotton, wheat and tobacco, appeared in the early part of the 19th century. Benjamin Henry Latrobe, architect, was responsible for many of the designs. In the Senate wing of the Capitol at Washington is a corn capital, and at Monticello, home of Thomas Jefferson, is a tobacco capital. Corn capitals are also found at the University of North Carolina. Evidently this American order was not accorded a popular acceptance.

Meanwhile, other civilizations were being evolved. From that Sumerian centre on the Persian Gulf, garden manners and customs journeyed up the Euphrates Valley. To this region we may now turn.

Babylonian and Assyrian Gardens

To that civilization which grew up through various laminations of Babylonian and Assyrian conquest we are indebted, we gardeners, for three contributions: the private park, the formally irrigated garden and the garden of terraces. We can also begin to trace woman's role and influence in gardening. As in Egypt, so here, the tree is an object of veneration and its culture is an essential part of the education of youth and the diversion of manhood. The worst punishment that can be visited on a foe is to cut down his trees, and to the Assyrian mind the ultimate symbol of eternal life was a tree growing beside a stream.

To them the tree above all others was the palm, and rightly so, for none is more generous in its services to man. The ancient Arabs used to say that the palm has as many uses as there are days in the year. Its wood furnishes building timber. From its fruit juice a milk was made, from its sap wine, from its syrup, sugar. Its tender tips were boiled for a vegetable and its fruit was a necessary part of the national diet.

The earliest of Assyrian gardens was probably nothing more than a grove of date palms near the house. Later vegetables were introduced, and finally exotic trees and shrubs and fragrant flowers.

A well-forested country of vast extent, Mesopotamia offered abundant opportunities for the chase. Hunting soon became the regal sport. Large areas were set apart by the king and nobles for hunting preserves. Because of their great size, there was no need nor any way to enclose them. In time, villas were built in these preserves to accommodate hunting parties and serve as retreats, and around them gardens were laid out within enclosing walls. Here flowers and fruits were cultivated. The water features consisted of one large pool with side channels that divided the garden into a pattern. Thus the walls marked the boundary between the wildness and informality of Nature and the conscious order of man-made planting inside. Finally the time came when this order leaped the walls to spread over the surrounding area.

Both the villa gardens and the extra-mural plantations were laid out formally. Rows of trees were regularly spaced, and between the trees grape-vines, as between the lines of mulberries and elms in Italy today, were swung from tree trunk to tree trunk. Bushes and flowers also they set out between the trees.

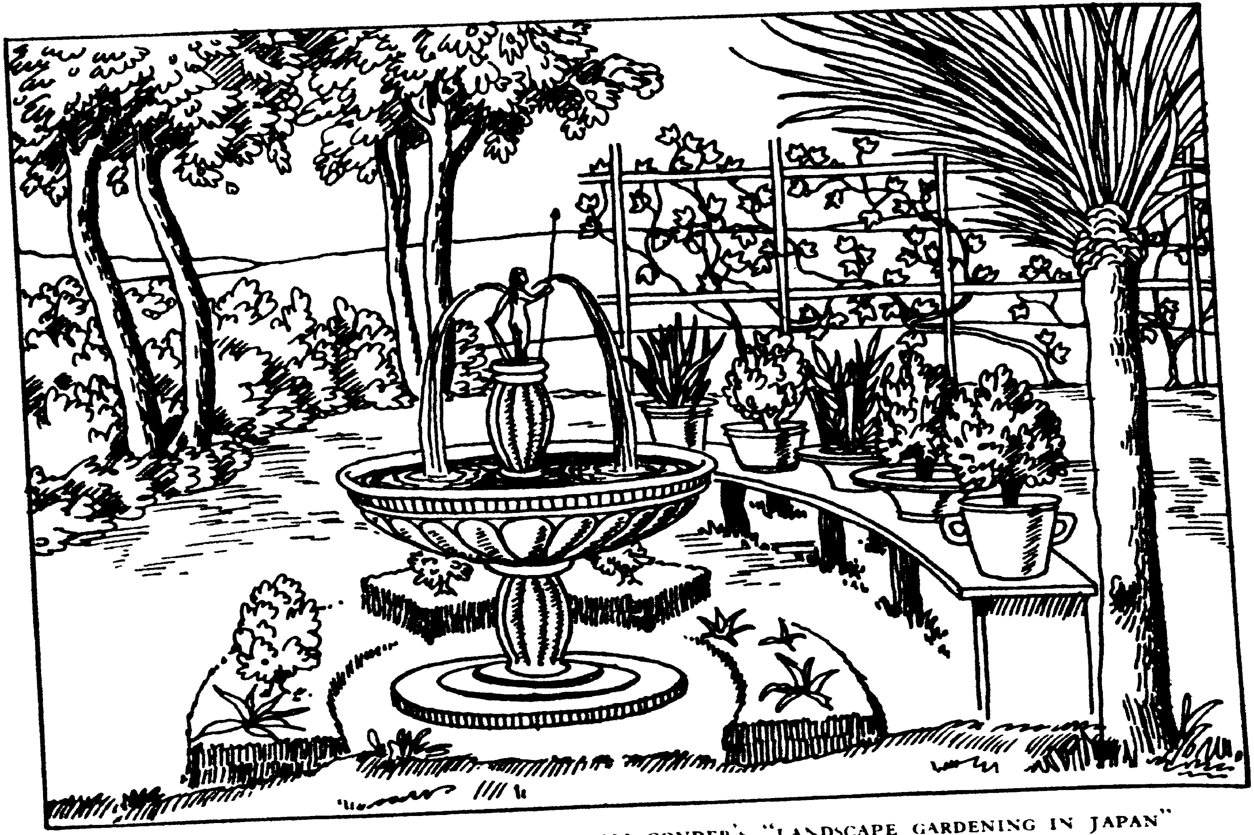
Such flower gardens as these Babylonians and Assyrians planted were near the house and appear to have been the particular care of the women. Due to their domestic influence and the need for a shady and cool spot, families soon began using these house gardens and vine arbours for *al fresco* dining. The Book of Esther describes the feast given by King Ahasuerus to his princes "in the court of the garden of the King's palace," a spot gaudy with white, green and blue hangings.

It was also to a woman (if legend be true) that history is indebted for the Hanging Gardens of Babylon. Piecing together the tales, we infer that these gardens were built by a Babylonian king, possibly Nebuchadrezzar, to please his wife, a Median girl from the hill country, who wept for the green mountains of her native land. They covered three acres—not a very large area in comparison with many a garden since—but sufficiently large and unused to impress the people of the time. The garden was like a stadium with stepped-back terraces supported by arches. The pillars of the arches were four feet thick and the outside wall, twenty-two. Over the arches were first laid wood blocks or planks sixteen feet long—so that the terraces were sixteen feet wide—and over these a sheet of lead and over the lead, tiles—pretty solid water-proofing. Finally came the soil in which bushes and flowers were planted. Trees also were set out on these terraces, and they managed to grow because the garden makers hit on a simple device: the columns of sun-baked brick—these terraced gardens were mainly of that material—were hollow and filled with soil, like a deep box, into which the tree roots could penetrate until they reached the earth beneath.

Under the terraces were royal chambers, like a series of rooms facing roof gardens in a skyscraper apartment house. Steps led from terrace to terrace. Water for the plants was drawn up from the Euphrates by spiral pumps manned by slaves. Thus the king made a green mountain for his homesick bride. Eventually the taste for terraced gardens filtered downward from the king to the nobles, and hanging gardens became quite the fad. Their descendants are still to be found in Persia. Our nearest counterpart in Europe are the ten mounting terraces of Isola Bella on the Lake of Como.

Among the kingly gardeners was Sennacherib (706–681 B. C.), ruler of Assyria, who laid out parks and gardens around Nineveh and introduced the cotton-tree. Another was Merodachbaladan

MODERN VERSIONS OF OLD SPANISH GARDENS:—ABOVE, A CALIFORNIA REPRODUCTION OF A MEXICAN COURTYARD; BELOW, AN ENGLISH REPRODUCTION OF A SPANISH PATIO



AN EARLY JAPANESE GARDEN SCENE FROM CONDER'S "LANDSCAPE GARDENING IN JAPAN"

II, King of Babylonia (721–710 B. C.), who took pride in his herb garden. The clay tablets record that he grew some seventy different plants in it, many of them cultivated especially for their fragrance.

One of the amazing products of this civilization was the Assyrian Herbal, compiled in the 7th century B. C. It contains the names of between nine hundred and one thousand plants, and specifies some two hundred and fifty vegetable drugs. Apparently the ailing took these drugs only after incantations failed.

In Ancient Persia

Ultimately the Assyrian and Babylonian lands passed into the hands of the Persians, who raised the gardening customs of their predecessors to a magnificent luxury. In their time the hunting park was made not only near cities, but also far off from them. The common people began to enjoy some of their benefits, too. These parks also grew in size under the Persian regime. At Celaenae, the largest city of Phrygia, Cyrus held a review of eleven thousand troops in a park. Rivalry sprang up between the nobles as to the extent and planting of their parks and villas. Gardening became a part of the culture of the people. Even the Persian youth, in addition to being taught how to forge armour and weave hunting nets, was obliged to learn how to plant and care for trees.

The palace and villa gardens developed into symmetrical courtyards with regular beds set into an orderly pattern, and the water channels were now walled with stone. The distant parts, however, were either left in their natural state or made into plantations. These ordered plantations the invading Greeks found all over Media and Persia. When Lysander the Spartan visited the younger Cyrus at Sardis, he admired the regularity with which the trees were planted, "how straight the rows of them were and how elegantly all the rows formed angles with one another."

What surprised him most was that the king told him he had measured the ground, arranged the planting and set out many of the trees with his own hand. This was unusual to a Greek, accustomed to only slaves doing manual labour. Pliny, the Roman naturalist, names certain kinds of palms, "Royal Palms," because they were preserved solely by the kings of Persia. These early monarchs were "dirt gardeners." They planned their national improvements in terms of gardens. When Darius transferred the capital of Persia from Pasargadae to Persepolis, he first created gardens to beautify it.

THE ROUND ARBOUR WAS A FAVOURITE EGYPTIAN MANNER OF GROWING GRAPES

Wherever in western Asia or Egypt the Persian influence extended, there also extended the love of gardens. Cambyses planted trees in Egypt. The Greeks and the Romans, sweeping successively over Persia, one after the other succumbed to this luxury of gardens. Alexander and his successors carried it from the flat tablelands of Persia into the valleys of India. No people were more influential in the spread of gardens and gardening than these

Persians. They gave centuries of vitality to the garden tradition.

One more thing did the invading Greeks discover and record for the delight of future generations: Xenophon says that the Persians called the garden a Paradise! For these Persians it was who gave to their gardens the romantic name which has spread through the world—eastward to India and westward to Spain.

Phoenician Travellers and Judean Stay-at-Homes

In the 17th chapter of Isaiah we find this grudging malediction: "Because thou hast forgotten the god of thy salvation and hast not been mindful of the rock of thy strength, therefore shalt thou plant pleasant plants and shall set it with strange slips."

This gives a clue to the gardening of those two Semitic peoples, the Phoenicians and the Jews, the one a stay-at-home race whose country proved a convenient corridor for the passage of warring peoples, the other a tribe of travellers.

First of all, the Phoenicians were fishermen, searching for the mollusk from which they extracted their precious purple dye, the use of which they learned from the Babylonians. From this they developed into traders and travellers whose ventures extended to the Mediterranean, Red Sea, Persian Gulf, and Indian Ocean. They lived in a narrow strip of fertile land shut in by the Lebanon mountains that furnished timber for their ships, and the shores were crowded with palm trees. Does not Phoenicia mean "the land of the palm"? Thanks to the fertility of the soil and foreign trade, they could soon afford luxuries, gardens among them. To their gardens they brought home those "strange slips," so annoying to the Jews, who were apt to be self-centred and satisfied in their horticulture, and could think of nothing in such bad taste as cultivating a lot of "exotics." Nevertheless the Phoenicians appear to have made interesting gardens with them, and to have kept them well watered with up-to-date hydraulic devices.

However, the Phoenicians cannot be said to have originated any garden forms. What they had they took from Egypt and Assyria —the formal, enclosed type of garden attached to the house. Carthage, the greatest of Phoenician colonies, was famous for being encircled with villas and gardens that threw the conquering Romans into ecstasies. They did contribute, however, to the garden legend: their personification of the revival and death of Nature was Adonis, whom Astarte, goddess of love and beauty, resurrected each spring.

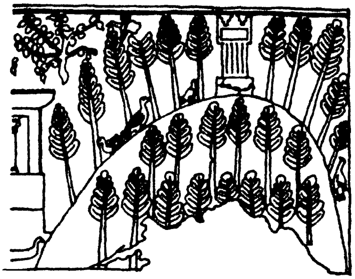
The Old Testament furnishes us with a fairly complete picture of agriculture and horticulture as practised by the Jews. Abraham planted a grove in Beersheba and used its shade for worship. Sacrificial groves, however, were soon forbidden: "Thou shalt not plant thee a grove of any trees near unto the altar of the Lord thy God." Immediately after the flood Noah deserted his ark of gopher wood or cypress and proceeded to plant a vineyard, and in a short time discovered what to do with the produce thereof. Jacob cultivated the grape-vine, the fig and the almond, three plants which, together with a well of water, seemed to complete a home. At least they completed a primitive arbour, and the Jews were partial to arbours and garden pavilions.

When Jacob sent a present to his son Joseph, then governor of Egypt, he chose almonds and pistachio nuts, honey, spices and myrrh. Olives, leeks, onions, lentils, garlic, cucumbers and melons were raised, and in their exile these were the fruits and vegetables the Jews longed for with bitter tears—and with good reason, for most of these are quenchers of thirst. Wheat and rye were also among their crops.

At least a hundred or more different plants, mentioned in the

Old Testament, can be accurately identified. Some bear deceiving names, however. The aloe was not the bitter herb of medicine, but a large tree—*Aquilaria agallocha*—which exudes a fragrant gum. Camphire was not camphor, but Lawsonia, which bears fragrant white and yellow flower clusters and contributes leaves from which a paste is made to dye the finger nails. The mulberry of the Old Testament seems to have been our trembling aspen and the chestnut the oriental plane or sycamore. Solomon's nuts were probably the almond, pistachio, walnut, hazel and chestnut. The shittah tree is the acacia.

Most of the perfumes used by the Jews were imported—balm and myrrh such as the Ishmaelites brought to Egypt, and frankincense carried by caravans from southern Arabia, and cinnamon, cassia, and aloes from India.


AN ARTIFICIAL HILL IN BABYLON

The greatest of all these Old Testament gardeners appears to have been Solomon, who had orchards, herb gardens and vineyards. Josephus said that he "was not unacquainted with any of the natures of plants nor did he omit to make inquiries about them but described them all like a philosopher and demonstrated his exquisite knowledge of their several properties." He raised nuts, we know, and pomegranates. Among his flowers he placed statuary. The plants he grew included camphire, cinnamon, frankincense, cedar, pine, sweet flag, aloes, lilies, grapes, saffron, figs and apples. His garden was rectangular and surrounded by a high wall. In it were aviaries and many other buildings. These were gardens both for utility and pleasure, for the orchard had its fountain and the herbs were grown for both their beauty and their use. Josephus states that one of the chambers of King Solomon's Temple was decorated as a garden room. The Song of Solomon, in which many of these facts are revealed, is one of the most beautiful garden poems ever written. Solomon, being a good business man, considered that a fair rental for his vineyard was a thousand pieces of silver!

Except once, when they fell from grace, the Jews were not given to tree worship. Yet in the 20th chapter of Deuteronomy strict injunctions are given against destroying trees even when besieging a city. Jews were accustomed to hold their courts in groves. The story of Susannah and the Elders, the first mystery-romance, affords us an idea of the trees grown in a royal Jewish garden, Daniel, in the role of detective, confounded the filthy old elders by tripping them up on the species of tree under which they alleged they espied Susannah and her lover.

Within the walls of Jerusalem itself there appear to have been rose gardens, but without the walls lay the more extensive and diverse plantations which were enclosed and had turrets for guards. An ancient law prohibited, with a few exceptions, gardens within the city limits.

Wherever these gardens were located, they seem always to have been laid out in a way to facilitate irrigation. The "fine rivulets" that Josephus says Solomon's gardens had were characteristic features. Throughout the Old Testament we find references and similes to water gardens.

From these evidences and their poetry we gather that the ancient Jews loved and tended flowers, but there is little proof that they ever contributed to the development of garden form and practice. Though the introduction of the cedar into Judea is attributed to King Solomon, the Jew seems always to have been wary of those "strange slips."

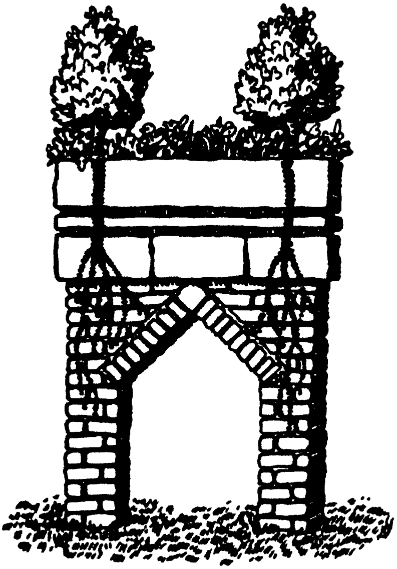
In recent years Jerusalem, at least, appears to have revived its gardening reputation. It now has a flourishing garden club which gives an annual flower show, although so far there have been displayed no such startling horticultural wonders as that exhibition bunch of grapes the two spies brought from Hebron on their shoulders.

In Buddhist Groves

That same Sumerian civilization which crept up the Euphrates and Tigris valleys also penetrated, as we observed before, into the East. We have to leap many centuries, however, before we come to evidences of its gardening. With Buddha we pick up the trail again—Buddha, the Lotus Flower. The dates of his life are about 620 to 543 B. C. Scion of a royal house in Nepal, he loved as a lad the cool shade of a pomegranate-tree in his father's garden. When he left the comfort of this home to undergo his ascetic career, he spent seven days sitting at the foot of another tree—a Bo—and here he received illumination. From its shade he went forth to preach his first sermon in the Deer Forest near Benares. So trees were always associated with Buddha and every follower after him sought tree shade for his light from on high.

For a long time they even argued whether trees had souls, and hesitated to cut them down. Consequently the worship of trees was an ancient custom among the early Hindus. Kings, Brahmins and villagers alike made annual votive offerings to tree deities. They enclosed the trees with wattle hedges or stone balustrades. Every convert to Buddhism dreamed of the day when he could contribute a sacred grove in which some anchorite might deign to live and to which the faithful would flock for their devotions.

In time these sacred groves became the public parks of the country. The injunction reads that they are to be "not too near the town, not too far away, well provided with entrances, easily reached by the people who are like to come, not too noisy by day, perfectly quiet by night, removed from disturbances and crowds, a place of retreat and lonely contemplation."



IN THE HANGING GARDENS OF BABYLON THE TREES WERE PLANTED OVER HOLLOW COLUMNS FILLED WITH EARTH

From these sacred Buddhistic groves, from the hunting preserves of the Persians into which the public was admitted, and from the gymnasium groves of the Greeks, mankind, in his climb up through the centuries, gradually evolved the idea of the public park. These early Indian groves were public recreation places, devoted to the interests of all people. They contained such buildings as were needed for their convenience, with a large tank and smaller ones for public purification.

Another public service found in Buddhistic India and Ceylon was the hospital, with its caste of lay physicians whose knowledge of medicine and surgery surpassed anything in Egypt or Greece. Many of the specifics they administered were of vegetable origin.

In their religious ritual the early Buddhist monks and the pious used flowers abundantly, the double jasmine being the most highly prized. On fête days the temple and altar steps were literally carpeted with them. So great was the demand for garlands that the garland-makers early formed a separate guild. There were also shops for the sale of both perfumes and flowers. In India today the flowers used in native worships must be "acceptable," that is, they must be raised in one's own garden; casual blossoms plucked from the fields or bought from hawkers are not worthy the divinity.

Among ancient Indians, gardening was considered part of one's civic duty. Villagers co-operated to mend roads, make bathing tanks, erect municipal buildings and plant parks. Women as well as men did the work. On the other hand, the small peasant proprietor was an independent fellow; he considered it a disastrous mark of social decay to leave his tillage and hire himself out to a rich landowner.

First and foremost, Buddhism is a religion of tranquillity. Wherever it goes it curbs the warlike propensities of people and brings them under the influence of those habits of living that make for peace. Consequently, when the monks and missionaries of Buddha carried their religion far and wide—to Ceylon, to Cambodia, to China and eventually to Japan—they also brought along their peaceful gardening customs.

Two centuries after Buddha's death they had reached Ceylon. On his conversion to the faith, King Tissa donated a wonderful park—the Mahamigha Garden, which his father had laid out—for a sacred grove. He ploughed its boundaries with a golden plough and built temples and shrines to hold relics. Of all its treasures the most highly cherished was a branch from the tree, so legend said, under which the Gautama had received his illumination. This eventually grew into a tree itself and was enclosed in a stone-terraced court. For the purposes of public worship, it was reproduced in costly materials—roots of coral in an emerald sward, green leaves set with precious stones, the fading leaves of gold and the fruit of coral. Ranged around it were vases of costly stones holding flowers fashioned out of priceless gems and filled with perfumed waters.

These gemmed Trees of Life we shall encounter many times, for they play a romantic role in mediæval literature. Even so late a poet as Southey, in "Thalaba, the Destroyer," describes them:

> Here towered the palm, a silver trunk,
> The fine gold network growing out
> Loose from its rugged boughs.
> Tall as the cedar of the mountain, here
> Rose the gold branches, hung with emerald leaves,
> Blossomed with pearls and rich with ruby fruit.

Montezuma, in far-off Mexico, is said to have caused an entire garden to be artificially wrought of precious metals. An even later descendant is the golden rose that the Pope bestows on Catholic royalty, as the mark of his supreme favour. Once merely a rose spray, it now takes the form of a jewelled tree mounted on a gold stand and studded with precious stones. The flowers are highly perfumed.

Another Oriental custom we shall encounter is the garden of tanks and baths in later India, and shall trace the naturalistic grove of the Buddhist worshipper to China and Japan and eventually to France and England. But that is getting far ahead of the story. The next logical step is into the gardens growing beside the road of Hellenistic culture—the gardens of Greece and Rome.

CHAPTER IV

GARDENING IN ANCIENT GREECE

THE early Greeks, who gave so abundantly to the beauty of the world, contributed very little to methods of gardening. True, Aristotle and his favourite pupil, Theophrastus of Eresus, laid the foundations of botany and profoundly influenced European botanical thought up through the 17th century, yet we rarely find evidences of early Greek influence on garden shapes or garden practices. Agriculture the Greeks learned mainly from Egypt, and such garden luxury as they later permitted themselves in their more affluent times—after the 6th century B. C.—they absorbed from the Babylonians, Persians and Egyptians. They had suburban farms to which managers rode out from the city, and the orchard seems to have been a favourite institution in early Greek home life. The pleasure garden, however, was not generally developed until later.

Those legendary gardens of Alcinoüs and Laertes that Homer describes appear to have been merely vineyards, orchards and vegetable patches. In Alcinoüs' garden, a place of about four acres "without the courtyard, hard by the door," there was an irrigation system of fountains and conduits and garden beds planted trimly, and an encircling hedge, but ornamental planting and garden form is not described in detail. Evidently not much was made of it. However, forty plants in all are mentioned by Homer.

These legendary Greeks were satisfied to grow their pears, pomegranates, figs and olives without an architectural scheme, although they were wise enough in horticulture to plant their beds so that they produced crops all the year round. We surmise that the garden was the especial care of the mistress of the house—not alone the garden in the women's court but the orchard as well. Penelope in the Odyssey says that her old servant Dolius is "in charge of my fruit garden." Sometimes the women turned this to good account: did not the mother of Euripides sell garden truck?

The early Greeks believed men sprang from the oak and ash. Temple groves and the groves around graves they held sacred, as did the people of all ancient countries. Their dryads and hamadryads were linked to trees, and they hesitated to cut down the trees lest it should bring death to these lithesome minor deities.

Several reasons have been advanced for the early Greeks' lack of interest in ornamental gardening. At first they were a poor people—and gardens in those days were luxuries for the well-to-do and rich. They were absorbed in politics. From time immemorial they tended to congregate in towns, which became so crowded that there was no room for extensive private gardens. They preferred to live in towns where they could go to the theatre and listen to philosophers at the gymnasiums rather than dwell isolated and unprotected in distant country villas. The rough labour of farming did not appeal to the average Athenian any more than it appeals to the average Londoner or New Yorker today. He enjoyed talking and debating. In the course of this, he developed an overwhelming admiration for democracy, and democracy rarely created those great gardens that stand as achievements of horticulture and architecture. There were exceptions, of course. Theophrastus so loved his garden that he willed it to eleven of his friends in perpetuity, to be held as a sacred possession. And Demosthenes, in one of his earlier speeches, complains—in a tone that sounds as though he had been descended upon by the local garden club—that trespassers had just about ruined his rose garden.

Eventually we begin to find some faint evidence of garden culture. Foodstuffs having become so abundant that his neighbours were no longer tempted to steal them, Cimon made a democratic and safe gesture by removing the fence around his vegetable patch! It was this same Cimon, so Plutarch tells us, who first adorned Athens with trees, "so that it abounded with clean alleys and shady walks," and thus lent an example to Greeks everywhere to improve the appearance of their towns with planting.

Whereas in early times a crown of leaves sufficed, by the 100th Olympiad (380 B. C.), worshippers, sacrificial victims, heroes and guests began to be crowned with wreaths of roses, violets, poppies, crocuses, lilies, hyacinths and parsley. Brides were garlanded with hawthorn blossoms, and the myrtle, symbol of authority, was worn by magistrates. Doubtless at first these flowers came from the fields, where they still grow in abundance and shepherds tramp them underfoot; later, as the demand for them increased, a cultivated supply answered the demand. This not only encouraged the taste for growing flowers but also gave rise to the employment of gardeners. Athens eventually had its established flower market where the young blades bought bouquets for their sweethearts; and housewives, flowers to decorate their rooms.

Greek Perfumes

From the Egyptians the Greeks learned—and, in turn, passed it on to the Romans—the custom of strewing their rooms with roses, decorating their wine cups and banquet tables with flowers, scenting their wine with spices and making both their bodies and their homes fragrant with perfumes concocted from flowers. In the beginning, this use of scents and fragrant flowers was closely allied to religious worship. It was also a phase of primitive sanitation, for scents and spices were believed to purify the air, help maintain health, and keep away evil spirits. Housewives strewed their rooms with black hellebore, which perfumed the apartments and broke the spell of witches and magicians. Theophrastus, in addition to his "Inquiry Into Plants" wrote a book on odours, in which he tells how rose perfume is made; and Aristotle, before him, hints at the process of distillation which the Arabs, many centuries later, were to discover and perfect.

The use of perfumes and cosmetics is as ancient as human vanity. The Old Testament contains constant references to their use: in the Book of Esther we read of the "oil of myrrh, sweet odours and other things" Ahasuerus bestowed on Hadassah for her purification. Proverbs tells of the strange woman whose bed was perfumed with myrrh, aloes and cinnamon. The Song of Songs has its beautiful allusions. When Solomon traded with Hiram, King of Tyre, perfumes and cosmetics were among the cargoes. And did not Jezebel, wife of Ahab, "set her eyes in paint"?

The Greeks' demand for perfumes and spices presupposes a thriving industry and traffic that supplied them. The spice, flower and perfume business flourished in Athens, Cos, Corinth, Cypress and Ephesus, and, in its time, Alexandria became quite the most famous of the perfume centres. Constantly Greek literature mentions this traffic, even preserving the names of its two most famous perfume-blenders—Peron and Megalus.

Megalus blended a scent compounded of burnt resin, cassia, cinnamon, myrrh, and oil of belanos, called Megaleon. From quince blossoms and sweet marjoram was made a perfume called Melenum, for which Cos grew famous. Ephesus produced its own particular and popular scent. Rhodes made one from crocuses, and Corinth distilled an iris water that, though it had the fragrance of violet, was called Irinen, being made from dried iris rhizomes. Still another perfume was concentrated from the peel of pomegranates. In many of these blendings rose oil was a common ingredient. Some were highly complicated: a perfume made especially for the King of the Parthians, so Pliny says, required thirty-seven ingredients.

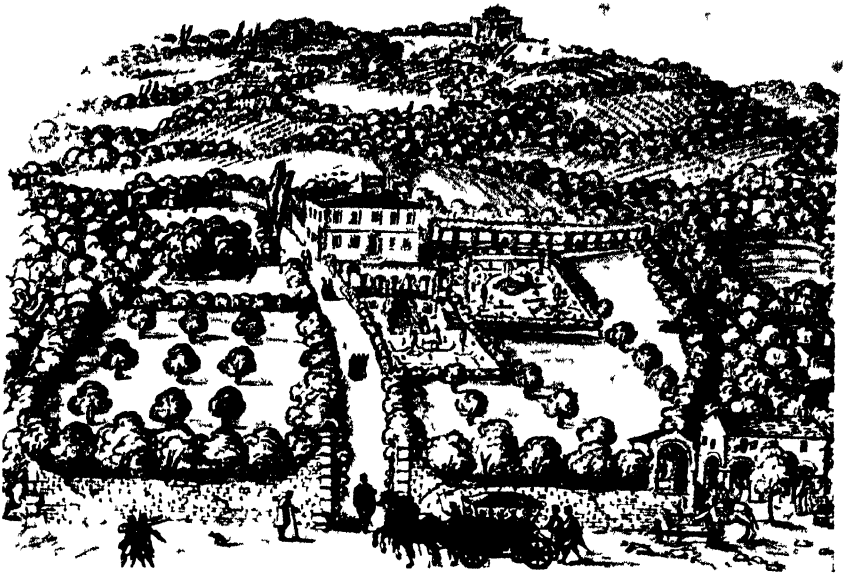
Pot Gardens and City Parks

Three contributions the Greeks may be said to have made to garden lore—the Adonis Garden, the city park, and, in their more luxuriant times, the country villa.

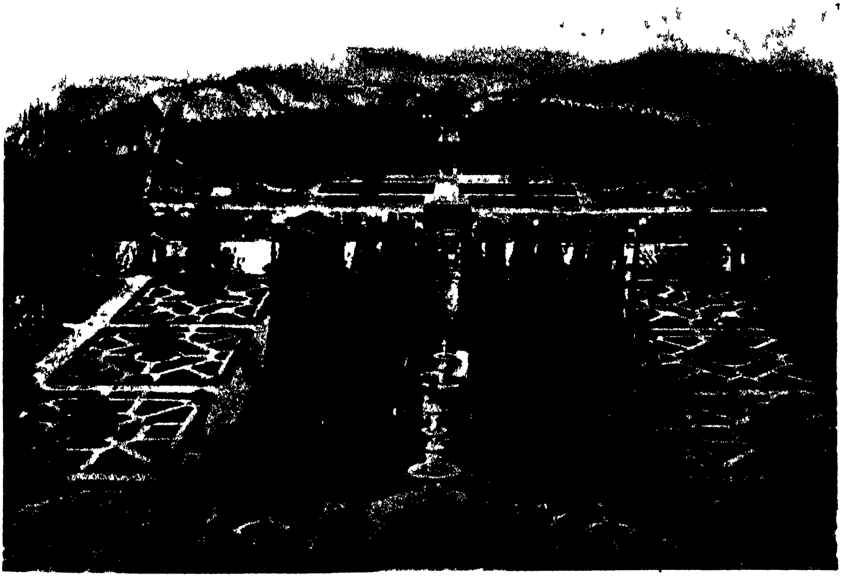
The worship of Adonis was practised by Babylonians, Assyrians and Phoenicians, and from the latter the Greeks borrowed it, via Cyprus, a Phoenician colony, as early as the 7th century B. C. In Adonis was embodied the spirit of the green growing world. When winter brought death to tender crops and stripped trees of their leaves, he was believed to have died—or disappeared into the bowels of the earth—and the women mourned him. "Delicate Adonis is dying." They beat their breasts and rent their tunics, as Sappho bid them. Bion, the bucolic singer, repeats that mourning in his "Lament for Adonis." Into this stygian darkness Aphrodite "with the face that gleams like gold" pursued him, eventually catching up with him and bringing him forth to the warmth of the returning sunlight again. Thus spring came.

Just as his autumnal disappearance caused women to mourn, so did his vernal resurrection cause them to rejoice. And their rejoicing took the form of Adonis Gardens—baskets or pots filled with earth in which wheat, barley, lettuce, fennel and various other kinds of quickly sprouting seeds were sown and religiously tended for eight days. When in bloom, they were placed on the flat housetops, or around a statue of Adonis. Theocritus, the idyllic poet, describes this festival, mentioning the "delicate gardens arranged in baskets of silver." These plants being short-lived in the summer heat—for the festival was held on the longest summer day—they were tossed away at the end of another eight days. At first they were charms to promote the growth of vegetation, finally their short duration came to symbolize any fleeting pleasure.

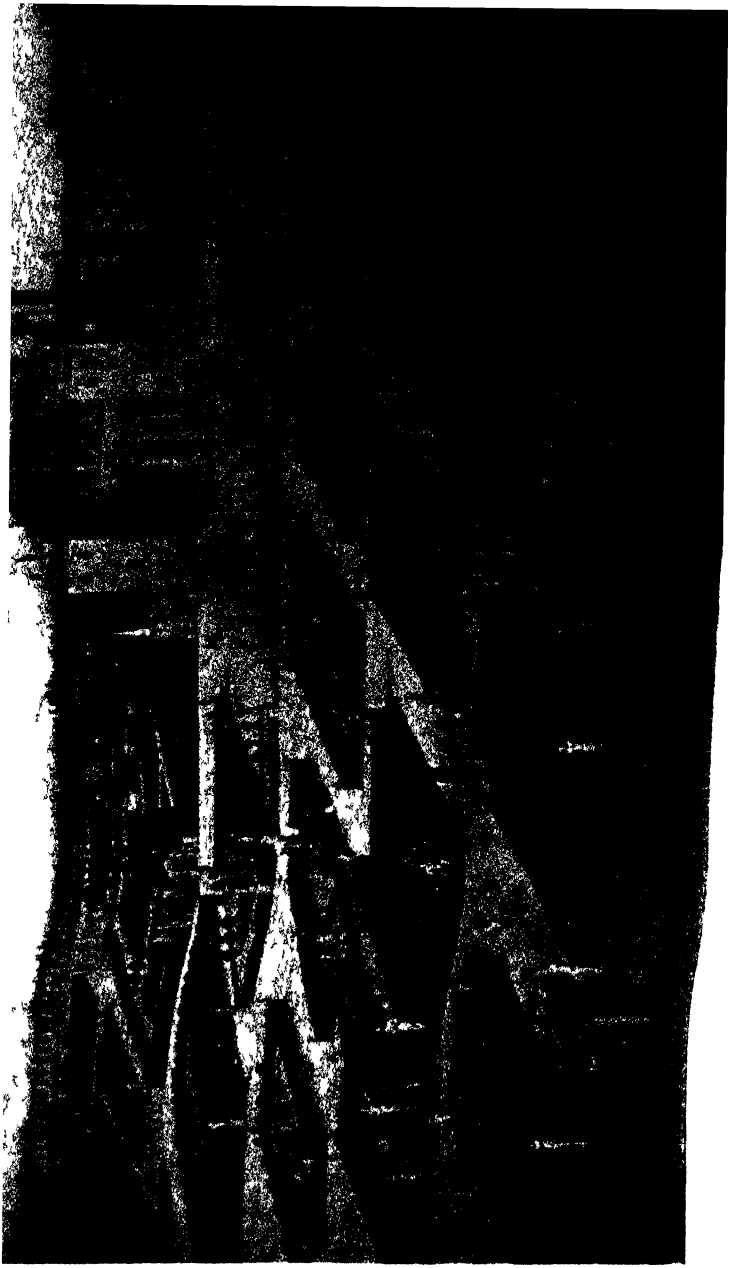
From this religious rite grew the custom of pot gardening that even in the days of Theophrastus was practised throughout Greece. First the plants were grown only for the Feast of Adonis, then plants were grown in pots and used for an all-season decoration. The Syrian women ranged their pots along the flat housetops, and the women of Greece followed the custom, until roof gardens became common. In their time the Romans carried the practice along; they planted not only flowers but bushes in tubs and set them around the courts and along garden paths. To this rite we can also trace the window box commonly used today the world over and once the glory of youthful Rome. It also gave rise, this Adonis rite, to that garden custom found in all Mediterranean countries, and transplanted to our own Mediterranean style of gardens in Florida and California, of many pots of flowers clustered along terraces and around pools, and set at intervals down garden paths. From this ancient use of pots it was an easy step to the custom of growing in pots those flowers one



VILLA MAMIANI ALLA FONTE, FROM AN OLD PRINT IN THE VATICAN



REPRODUCTION OF A FLORENTINE GARDEN OF 1500, BY E. LUSINI, ARCHITECT



cherishes most.

As we saw in the previous chapter, the Persian park, when located near a town, was often open to the public. It was a rich man's domain, and he permitted the public to enter it. The Greek public park was the possession of the people from the beginning. The earliest form was probably a sacred grove, dedicated to deities and heroes, and with votive tablets hung on the trees. Here the first public games were played. From these groves the gymnasium was evolved. In some places the gymnasium began as an open treeless spot—at least in Athens—until Cimon planted it with plane-trees, which gave a widespread shade. He set trees in the Academy and in the market place as well. Gradually the Greek City Fathers began to realize that the architecture of these public buildings deserved an appropriate setting and therefore made gardens around them.

The Academy lay in the suburb of Athens called Ceramicos, and, in time, it became a spot of great beauty—surrounded by a wall and enriched with marble-edged water canals. There were plane-tree alleys and narrow paths, called "philosophers' walks," edged with shrubs, amid which stood small temples, altars, colonnades, pavilions, and benches, and in one part was a long, oval, marble-bordered race-course. It was in the Academy that Plato taught.

Aristotle taught at the Lyceum, which lay on the north, back of the Ilyssus, a grove splendid with a frescoed colonnade. Theophrastus and Demetrius built a museum in its grove. Still another resort was the Cynosarges, to which Athenians and foreigners alike were welcomed. Here Antisthenes conducted his conversations. From the name of his grove we derived the word "cynic."

Though these various grove schools began as public places, the crowds soon grew so large and so noisy that philosophers were forced to lay out their own private gardens. Plato moved his school from the Academy to his own place, and in their time Epicurus and Theophrastus were obliged to do the same. Among the most famous of these private gardens were those of Epicurus, of whom Pliny writes, "that connoisseur in the enjoyment of a life of ease was the first to lay out a garden at Athens; up to his time it had never been thought of to dwell in the country in the middle of town."

Temple Groves and Their Deities

In addition to these scholastic and gymnastic resorts were the *hierokepis,* the holy gardens or sacred groves reserved for worship. Thus Altis, the grove surrounding the temple at Olympia, had its trees and flowering plants and innumerable bronze and marble statues. The grove at Cnidos, dedicated to Venus, was a park of cypresses, plane-trees, and myrtles. Not alone the deities, but public heroes also had groves set apart to their memory. Eventually this custom of statuary amid plants crept into private gardens, a practice we can trace thence to Roman villas and so on down to the statuary in our own gardens today.

Moreover, this custom of preserving a grove sacred to a deity or a hero gave rise to individual flowers and trees sacred to them. Just as the Egyptians had temple groves in which were grown specimens of one kind of tree associated with a god, so did Greek religion and public custom bring about many flower associations that we inherit in our common names of plants. The pine was dedicated to Pan and Boreas, the oak of Zeus, the beech to Hercules, the ash, the yew and poppy to Ares, the fir and ivy to Bacchus, the olive to Athena, the myrtle, apple and rose to Aphrodite, the mint to Pluto. The laurel represented the transformation of Daphne into a tree when she fled Apollo's advances, the tears of Lycurgus germinated the cabbage, and from the bath of Aphrodite sprang the lovely rose campion. Aphrodite, the violet-crowned, was patroness of flowers.

Adolescent Christianity was quick to take over many of these ancient customs and strut in the borrowed plumes of Paganism. Flowers were renamed for Christian saints. The Reformation, which would have naught to do with the hagiarchy that the Roman Church had evolved, changed many of them back again to the old pagan names, so that today we have almost as many common names associated with Venus as with the Virgin Mary.

One type of sacred grove that began to thrive in Greece also saw the progress of a vast humane profession—the temples and groves sacred to Aesculapius. According to the Odyssey, Aesculapius was taught medicine by Chiron. By 800 B.C. he had joined the ranks of the Greek deities and temples were erected for his worship at Cos, Crotona, Epidaurus and Pergamos. Here priests jealously guarded the mysteries that had been handed down from Egypt, from the god Thoth, or Hermes, as the Greeks renamed him. These temples, located in healthy, beautiful spots near mineral springs, attracted both the sick and the student of medicine. To the high priests or *asclepiads* was assigned the esoteric lore; to the lower class clergy the knowledge of herbs and the compounding of drugs from them. The latter, then, were the druggists of the time. They supplemented the work of the *rhizotomoi* or root diggers, the men who made their living by collecting medicinal roots and herbs, and who were the ancient ancestors of those picturesque herb pedlars known to our early American forebears. Some of these *rhizotomoi* appear to have studied the diseases of plants and suggested cures for them, thus being the forerunners of our present-day plant pathologists.

It was customary for grateful patients to hang in these temples votive tablets describing their symptoms and cures. These "case histories" were studied by the priests. In this way less of a mystery was made of medicine, and schools eventually were attached to the temples where students or *asclepiads* were trained. Such schools were found at Epidaurus, Pergamos, Crotona, Athens and Cos.

Among the students at Cos in the 4th century B. C. was one Hippocrates. As the result of his observations, he was constrained to leave the sacred grove and take the first step forward, a step that won him the name of The Father of Medicine. He determined to divorce medicine from its occult practices by tracing the natural origin of diseases. In the concocting of his doses he used over two hundred plants, many of which are still found in our pharmacopœia. Moreover he began to prescribe medicines not only according to the class of disease but also according to the condition and bodily character of the patient. He it was who established the Hippocratic oath, the standard of ethics for the profession for all time. A great man, Hippocrates; he lived in an age of giants, being contemporary with Pericles, Plato, Pythagoras and Sophocles.

Greek Botanists

The son of one of these temple-trained physicians was destined to become the Father of Natural History—Aristotle. Born 384 B. C., he first studied under Plato and then was tutor to the young Alexander, from which post he went on to Athens where he was assigned the Lyceum. It soon became the centre of the

Peripatetics, or walking philosophers.

Aristotle's favourite pupil, Theophrastus, in due time, rose to equal fame. Born 370 B. C., his first master was Plato, from whom he passed to the tutelage of Aristotle. On Aristotle's death Theophrastus received by will all his master's library and manuscripts, and was nominated as the successor of the great philosopher. Theophrastus gathered about him two thousand pupils. While he was not engrossed in teaching them, he pursued his own investigations and wrote. He is said to have composed more than two hundred treatises. Two of them survive—the "History of Plants," of which we have nine of the original books, and the "Causes of Plants," of which six of the original eight remain. Though he mentions over four hundred plants, his observations were primitive. Nevertheless, on account of his own work and because he was the heir of Aristotle's learning, he has come to be called the Father of Botany. As such, he guided the thought of plant students up to the Renaissance and beyond.

DIOSCORIDES, THE GREEK PHYSICIAN AND BOTANIST

Another Greek physician who was to influence medicine for sixteen centuries was Pedacius Dioscorides of the 1st century A. D. A court physician attached to the Roman Army, he travelled in Greece, Italy, Germany, France and Spain, collecting plants wherever he went. About 80 A. D. he wrote a materia medica that lists over four hundred plants and compiled the knowledge of his predecessors. It remained the highest authority on drugs as late as the 15th century.

To these great figures should be added a third—Crenatus, an herbalist, collector of plants and physician to Mithridates VI, Eupator of Pontus, and whose claim to fame is that he illustrated the first herbal.

With Galen, the Greek herbal assumed a permanent form. Claudius Galen, born in 130 B. C., travelled in Palestine and Asia Minor studying plants and writing books. Of the four hundred tomes he is said to have composed, eighty-three have come down to us. His herbal, which contains a list of drugs and their uses, is commonly known as "De Simplicium"—concerning simples. Many subsequent plant treatises were based on this book.

These names we shall be encountering again and again in this Story of Gardening, for they set a great army of men to studying plants and collecting them in every corner of the world that they might relieve their fellow men of ill health and incompetence in the face of natural forces, men who were the ancestors of all who have since served in the conquest of disease—even to Pasteur, Lister, Ross and Osler of our own era.

The Greek House and Garden

It is rather arresting to realize that what we do today in locating houses on suburban sites, the Greeks did many centuries ago. Today the noise, stenches and confusion of automobile traffic have caused us to place our houses with their backs to the street. Our living rooms are in the rear, facing the garden. The clatter of the narrow streets in Greek cities made house owners do precisely the same. The garden was in the rear, enclosed by wings of the house, and at the farther end, just as we have a wall or a fence along the property line, they piled up a high bank, on which sometimes they planted masses of flowers and sometimes a protecting and shady grove of trees. Between this rear bank and the house lay the garden itself.

The living rooms of the Greek house faced an open court formed by the wings, along one side of which ran a hall of columns. From this originated the peristyle or court surrounded on all sides by a columned portico. The court was paved and adorned with potted plants. Here also the women tended their vegetables and small flower patches. It was believed that the fragrance of flowers made the house healthy, so they were planted quite close to the living rooms. These were very orderly gardens—the small flowers all being grown together and the large with the large. In the gardens outside the court, lilies, roses, violets and crocuses were grown in beds between the trees. Statuary abounded in these gardens.

Evidently the Greeks did not clip their trees into formal shapes, as did the Egyptians; rather the influence that affected them was Persian, which permitted trees to grow as they would. The favourite trees, as we have seen, were the plane, the pine, and the cypress. The last was usually planted around tombs, which were located on the grounds of the family. About the grave were also set fragrant plants—pungent parsley and roses especially—to purify the dead, and asphodels and mallows to nourish their spirits.

From his Persian raids, Alexander brought back the influence of that country to his native Greece, and Greek agriculture was considerably stimulated by the increase in knowledge of herbs and plants following on his conquests. Much of this information Theophrastus set forth in his botanical works. Doubtless many new plants were brought home, which would account for the rose gardens of which Demosthenes speaks, the gardens containing a great abundance of varieties. Due also to this Persian influence, the gardens of the courtesans became famous, and the Adonis gardens made roof tops colourful. Ultimately, however, Athenians began going back to the soil—their gardens extended beyond the limits of the city; and wherever the Greeks developed their colonies, they carried with them the Persian love for gardens.

Harpalus, left behind in Babylon as governor, forthwith set about to raise plants from Greece in his palace yard, although it grieved him (like many a homesick gardener in far places ever since) that he couldn't succeed with some of the plants from his native heath, ivy especially. When Dinocrates, the architect, laid out his great city plan for Alexandria, the gardens and squares surrounding the palaces and public buildings absorbed a third of the space within the walls. This same Dinocrates (be it said to his lasting dishonour) first conceived the custom of spoiling mountains by carving them into heroic statues. He planned to chisel Mt. Athos into a gigantic figure of Alexander, with a city in his right hand and a reservoir in his left! Ever since then the sleep of sculptors has been troubled with bizarre and tortured visions of ruining noble mountains by just such carvings. Already Amercans are indulging in this destructive nonsense.

Wherever Greek colonists went they took many plants with them, especially the vine. In Egypt they were active agriculturists. One of them, Apollonius, conducted a nursery at Memphis in which he transplanted garden fruits, grew eleven varieties of grape-vines and even undertook to grow timber commercially for the Alexandrian shipyards.

By the time the Greeks were well settled in Sicily, their gardens showed amazing luxury. At Syracuse, Dionysius had gardens where he gave his famous banquets, and it is related that Hiero

II built a war galley on the deck of which he spread soil and planted flowers in beds held by lead frames and laid out walks shaded by vines and even set up a garden house! They say the deck was so crowded that there was room for only three seats! It was this same Hiero who was patron of Theocritus and doubtless was charmed by the bucolic verses in which this town-dwelling bard idealized country life for the delight of city people who had wearied of streets and the traffic on them. Carthage, too, had her public gardens, and in grim Sparta the youths so succumbed to luxury as to exercise under the shade of gigantic plane-trees.

As commerce and conquests brought wealth and power to the Greeks, they permitted themselves to become saturated with the idea of a luxurious garden. They built country villas, encircled with well-tended plots, and they imported and cultivated exotic plants. They even went so far as to place in their sacred groves imitation grottos, a form of artificial garden adornment later brought to a high ceramic achievement by no less a person than Bernard Pallisy in Paris and to give delight to that strange little fantasy of a man, Alexander Pope, in his cherished garden at Twickenham.

As Greek culture spread over the countries surrounding the Mediterranean, it carried with it the taste for country living—for the privacy and isolated ease of the rustic villa. And this was, perhaps, the most pronounced garden heritage that Greece handed down to Rome. This, and the gentle art of enjoying tranquillity and conversation in a shaded, leafy place. For we cannot leave these Greeks without recalling those three aged wayfarers Plato tells of—Cleinias, Megillus and an Athenian stranger, off on a pilgrimage to the shrine of Zeus. The day is hot, the road is long. They beguile their tedium with talk. "And on the way," Cleinias promises them, "we shall come to cypress groves exceeding tall and fair, and to green meadows, where we may repose ourselves and converse."

To rest amid the shade of green growing things and there to converse is among the most precious parts of garden enjoyment. A rich enough heritage for one people to hand to another!

CHAPTER V

ON ROMAN ROOF GARDENS AND COUNTRY PLACES

IT is difficult to realize, when one beholds the glory that is Rome, that once on a time it amounted to little more than a market place serving a hamlet of truck gardeners. The earliest of its horticultural writings—Marcus Porcius Cato (234–149 B.C.), Marcus Terentius Varro (116–28 B.C.), and later, the Spanish-Roman, Lucius Junius Moderatus Columella—are on farming and useful gardening. Cincinnatus, working his few acres with his own hands, was one of the good old farm heroes. However, the town did deck its window ledges with flower boxes or "mimic gardens." This, of course, was before burglaries forced Roman citizens to bar their windows.

The average Roman of the earliest days lived on vegetables, and he had his little patch in which he raised them—asparagus, beets, cabbage, endive, fennel and leeks; and the best of them, said Cato, the old Sabine farmer, was the cabbage. Men of higher rank and affluence, who enjoyed country living, or *res rustica,* owned, and themselves cultivated, large farms or *horti,* both inside and immediately without the city limits. They drew much of their income from the sale of vegetables and farm crops at the *flora holitorum* or produce market.

Both the small patch of the ordinary citizen and the farm included its bed of flowers, grown to be woven into chaplets for wearing at religious ceremonies. Here he grew his favourite hyacinths, his narcissi, violets and roses. Sometimes the window boxes provided these blossoms and sometimes the door yards. Flowers could be bought in the market, too. Varro suggests that peasants include them among the vegetables and wares they hauled to the market in Rome.

As culture and wealth increased, the richer families developed a passion for larger places on which less farming was done and more decorative gardening. The last century of the Republic saw large town gardens with architectural effects beginning to appear—although some stern citizens thought them far too luxurious—and, through the first three centuries of the Christian era, Rome was developing into a garden city.

One of the first to have such a city garden was Tarquinius Superbus—ca. 540 B.C.—who cultivated beds of poppies, roses and lilies in a plot through which a stream meandered.

Eventually the Janiculum Hill was occupied by Julius Caesar's place and the Pincian by Acilius Glabrio's and the Palatine by Domitian's. Where the Vatican stands today was Agrippina's garden, and along the Tiber shores stretched the town estates of Augustus, Pompey, Nero and Caligula.

Gradually, as more and more land was usurped for these town gardens, the average citizen was crowded into a smaller area, but, being a flower lover, he was not to be done out of his garden. He took to his roof, setting boxes and flower pots on its flat top. The middle class citizenry soon developed these *solaria* into successful and often elaborate gardens. They planted flowers in a deep layer of soil laid over a heavy water-proofing of planks, flagstones and mosaics. Lead and stone vases added their decorative notes. Sometimes trees were made to thrive in big boxes. These little roof forests they called *sylvae in tectis*. The pergola also became a common feature of roof gardens, serving as ancestor to those roof-top loggias still found on many a Florentine villa and on the miradors of Spain. Truly these Roman garden-lovers followed Cato's precept—that "a city garden, especially of one who has no other, ought to be planted and ornamented with all possible care."

Meantime the poor were huddled into *insulae,* or tenements in the Plebeian Quarter, which soon degenerated into such a slum that it was torn down and the Baths of Caracalla were erected on the site in 212 A. D. Nevertheless, the poor had the run of public gardens. Although the nobles seized all the land they could lay hands on for their country places in town (four acres being considered the least area a man of taste and wealth should own), several of the emperors strove to correct this situation, to give Rome back to herself, by laying out public parks. Augustus instituted many of them and even provided a public recreation area around his tomb. The mausoleum of Hadrian, now called the Castle of St. Angelo, was ringed about with terrace gardens that the public eventually enjoyed. Caesar willed his garden, including a game area and much statuary, to the public. Pompey likewise added to these parks. By the end of the 3rd century A. D., Rome had eight *campi* or commons for public games and thirty public parks, many of which had previously been private places. In addition, the commoners could enjoy the gardens of the temple groves, the cemeteries and the baths.

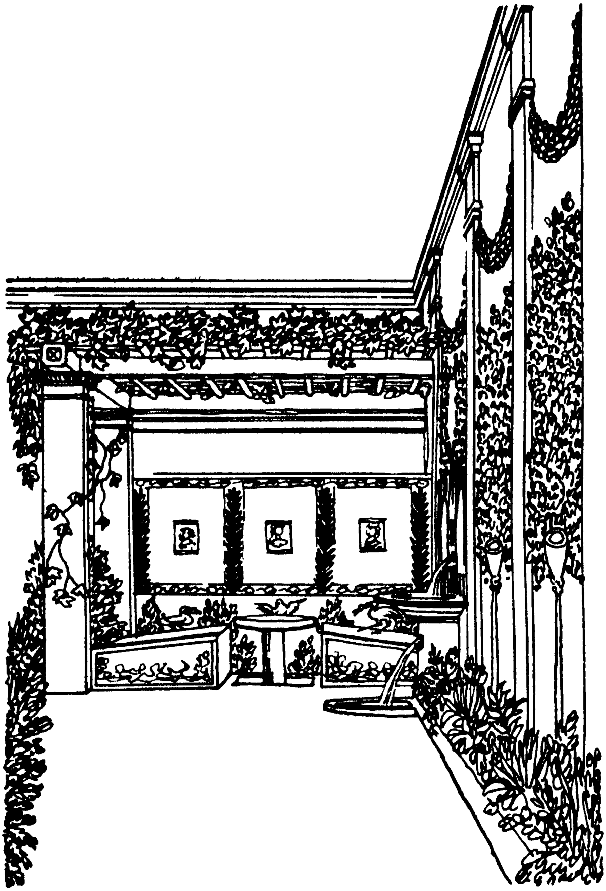
Thus Rome was a garden city and endeavoured, as Pliny the Elder said, "to make city and country all one," from its earliest years, and it continued so until the time of the invasions from the North. When Alaric marched through its gates in 408 A. D., he found no less than seventeen hundred and eighty residences of wealthy citizens surrounded by gardens. To this day many of the great gardens that enrich the city of Rome are descendants, in part, of those that Sallust, Lucullus, Maecenas, Caesar and Pompey, enjoyed.

What Roman Town Gardens Were Like

Early Italian gardens fall roughly into three groups—the small city place, the large town place and the country estate. By making a composite of several of the features found in each of these, we can catch an idea of what each type was like and, incidentally, recognize the ancestors of many features found in our gardens today.

The average well-to-do man's place in Rome was a *suburbanum,* a little suburban property on which he kept a man and wife and a slave or two. If he owned a near by farm, it was called a *fundus suburbanus,* and here fruit and vegetables and foliage for garlands were grown in an irrigated garden. From the latter the large pleasure gardens developed. For examples of the small town and suburban garden, we turn to the excavations at Pompeii and Herculaneum where, in recent years, houses and their gardens have been carefully restored. Although Pompeii by no means could have been called a garden city, as we use that term, here we do find that even the smallest house had its garden, however tiny that garden might be. The gardening urge extended to all classes in Roman times, even as it extends today in England from the big estate owner to the poorest cottager.

Pompeian houses clearly show the mingling of Greek and Roman influences, for Pompeii was a Greek town with Roman habits and life superimposed. They consisted of the atrium in front, around which the living rooms were grouped, and the peristyle or colonnaded garden in back. The atrium in earliest

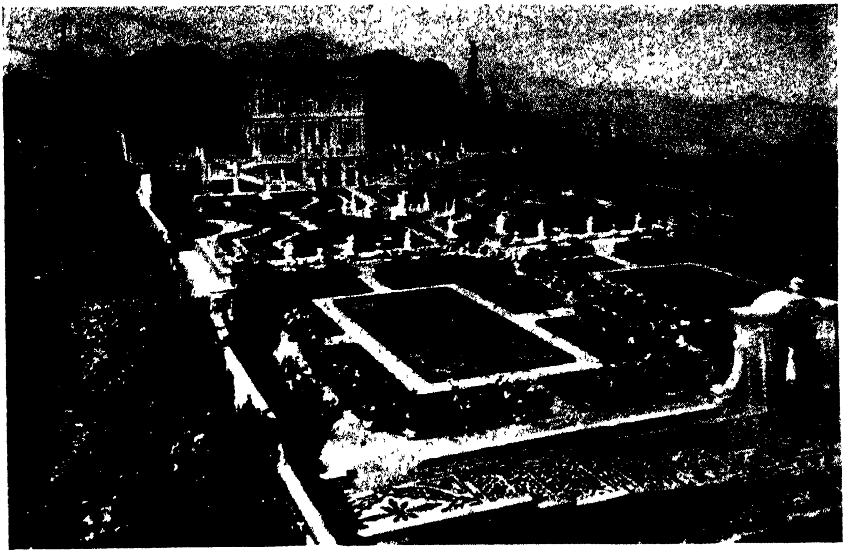


THE HOUSE OF SALLUST AT POMPEII, SHOWING THE PAINTED GARDEN WALLS

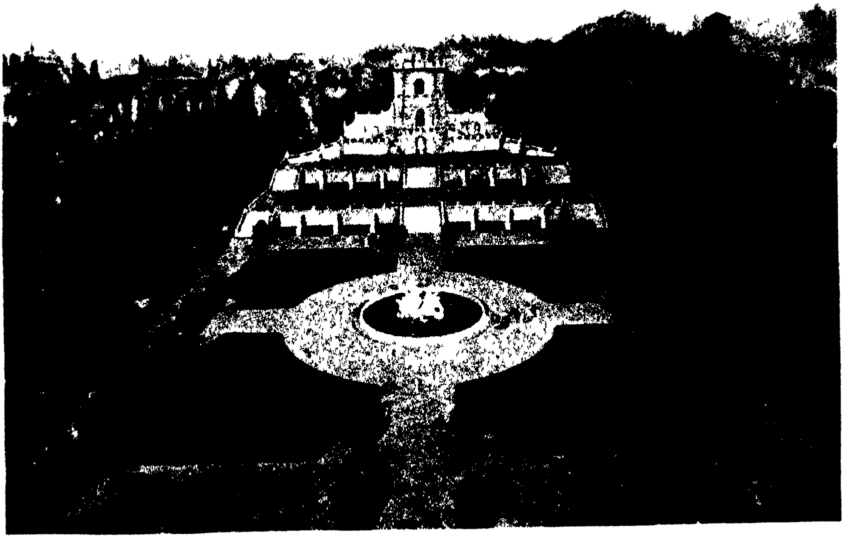
days was merely a room with an open hearth fire and a hole in the ceiling to let out the smoke, which blackened the walls—made it *ater*—the black of charcoal, thus giving the name to the room. The peristyle was a Greek importation, deriving its name from the Greek word for posts, since posts supported the roof that covered the footpath around the four sides of the garden. The opening in the atrium roof let in rain water, which was collected in a shallow cemented pool called the *impluvium* and thence run into an underground cistern that had an opening into which the owner could dip. To this day the Italian gardener prefers to dip his watering can into a fountain basin rather than avail himself of the modern and easier method of using a hose. Plants that enjoyed growing with their roots in damp soil were set around the *impluvium,* just as we set oriental iris and astilbe around a pool today. Eventually, as piping was introduced, the hole in the atrium roof was glazed over and it was resolved into merely a dark room, sometimes with a second story, and the peristyle became the centre of family life. It is the peristyle that interests us as a garden feature.

This courtyard was laid out formally, with small regular beds for the cultivation of flowers, with altars, miniature temples, water basins, a fountain and sculptured figures. Vines grew up the columns and along the walls, and where they did not thrive vines were painted. In order to make these little areas appear larger, the walls were frescoed with garden scenes done in perspective, picturing trellises, pergolas, statuary and fountains that seem quite modern indeed when we find the same features in 16th and 17th century gardens laid out by Mollet and Boyceau. Sometimes the middle garden feature was a large flower bed divided by a small stream issuing from a central fountain.

Among the flowers a Pompeian housewife proudly pointed out to her husband when he came home at night were lilies, roses, violets, pansies, poppies and iris. In the various Pompeian frescoes fifty different kinds of plants have been identified. Sometimes the flower beds were edged with small stones and sometimes with a low cement coping. It also became fashionable in smaller



MODEL OF A GENOESE GARDEN OF 1500–1600, BY G. CROSA, ARCHITECT



A PIEDMONTESE GARDEN OF THE 17TH CENTURY, AS DEPICTED BY G. CHEVALLEY, ARCHITECT

VILLA DELL IMPERALE AT PESARO, FROM AN OLD MANUSCRIPT IN THE VATICAN

FLORENTINE GARDEN OF THE 13TH CENTURY—A GARDEN OF BOCCACCIO'S TIME —SHOWN IN MODEL BY E. LUSINI, ARCHITECT gardens to build flower boxes two to three feet in height between the pillars of the peristyle, so that these gardens had flowers on three levels—on the ground, in the boxes and painted on the walls.

In addition to the peristyle, the owner might have another garden behind the house, where vines and fruit trees grew, and where he would introduce a miniature grove with a picturesque shell-work grotto, a waterfall and a cage for birds. Evidences of two other kinds of gardens are sometimes found—a little vine bower outside the bedroom, that served to shade it, and a small flower court near the dining-room, or *triclinium*—so called because the Romans reclined on couches to eat—which offered a pleasant vista to gaze at during meals. Larger houses even had an extra or pseudo-peristyle with pillars on only one or two sides and with the other walls frescoed with paintings of bushes and flowers. This was rare in Pompeii, however, where land was at a premium.

Just as the small gardens were laid out in an architectural or formal pattern supplemented by consciously artificial devices, so were the large city places. Here, however, the extent of the land allowed for other features which were considered essential. The first was a *gestatio,* a broad path, sometimes made of clipped turf, sometimes paved, along which the owner and his guests walked or were carried in a chair for an airing. The second feature was the *hippodromo,* which was a place to drive around, an area of paths and roads surrounded by box hedges and trees. Occasionally a naturalistic effect was allowed—an informal clumping of shubbery and trees.

After the burning of Rome, Nero laid out a magnificent informal place for himself around his new palace, with expansive lakes, fields of vast extent and woods and forests "stretched to immeasurable length." This landscaping was developed under the guidance of his architects Severus and Celer, "who had the genius and boldness to try to accomplish by art even what Nature had denied."

Such naturalistic planting was so exceptional that Tacitus thus remarked on it. For it was the exception. Most Roman gardens were filled with marble statuary and finely designed temples and seats, and their shrubs and trees were clipped into all manner of fantastic shapes.

Topiary Work

Just where the Romans learned this bush-barbering custom, we do not know. The Egyptians occasionally clipped their trees into columnar shapes, but it remained for the Romans to raise topiary work to a fine art. Pliny says that C. Martius Calvena, a friend of Caesar and a favourite of Augustus, first taught his countrymen the topiary habit. His vegetable sculpture took the form of walls, beasts, ships, letters and fantastic designs, sometimes placed singly, sometimes in groups. A hunting scene with a pack of dogs chasing a fox would be made from a box hedge, or, if the owner was fond of the sea, his cypresses would be clipped into the semblance of a fleet of ships. Because of the prevalence of this shrub-sculpture, the gardener to whom the work was entrusted, became a specialist, being called the *topiarius*. Quintilian defends this custom stoutly: "Should I observe the branches of yonder olive shooting into luxuriance, I instantly should lop it, with the result that it would form itself into a horizontal circle which at once adds to its beauty and improves its bearing."

Nor did this tree and shrub clipping stop with the Romans. It appears in the Renaissance and, from Italy, was carried to

France thence to Holland whence it was taken to England. Rome was the father of it, and a Roman garden was judged by the number of topiary accomplishments it contained.

Of course this style of garden decoration did not please all people. The poets especially were incensed at it. Poets have always battled for naturalistic gardens. In 18th century England, as we shall see later, poets helped fight formalism and bring about the popular acceptance of the informal gardens we now know.

Country Gardens

As Rome itself became more and more crowded, the gardening and horticultural urge began spreading out into the Campagna, where, in imperial times, a good water supply and ample drainage made country living possible. Wise men retreated, as Horace put it, from the *fumum et opes strepitumque*—from the noise, wealth and smoke of Rome. There were no country hotels or summer resorts at the time, consequently one had to build a villa or several of them in different localities. Often rich Romans owned both a town place and a place in the suburbs, a *domus suburbana.* They lived in the city in the winter, in the suburbs in spring and autumn, and down at the seaside in hot weather. Scipio Africanus was the first to have a rural villa to which he could retreat from the noise of town. Due to the popularity of these suburban places, Rome soon became ringed about with really splendid estates, and farms grew and flourished.

In the beginning the farm house or *villa rustica* was simple and plain and the frugal farmer-owners lived on the place all year round, content to follow Cato's precept, "First plant, then build." The farm house, standing isolated on its own grounds, was surrounded by a kitchen-garden with a stream or well for watering the crops and cattle, and with the necessary outbuildings—slave quarters, stables, and sheds in which were kept the carts, implements and oil and wine presses. Such a place was probably Horace's Sabine farm—"a piece of land, not so very large, where there would be a garden and near the house a spring of everflowing water and up above these a bit of woodland."

Others were oil and wine plantations, owned by absentee landlords, who visited them only when required. Cato's book on farming, the oldest prose work in Latin, having been published in the 2nd century B. C., is a guide for the management of a small estate, a farm of about one hundred and fifty acres, with vineyards, olive orchards, a meadow for raising grain and forage crops and a willow plantation or *salictum* from which were cut the supple branches for tying up the grape-vines. (Many nurserymen today still tie bushes and shrubs for shipment with these withes.) There might be a reed bed too, from which supports for the vines would be cut. The vineyards were of two kinds—a *vinea,* where the vines were grown on posts and planted close together; and an *arbustum* or *vinea arboresque,* where the vines were swung between trees and the intervening spaces used for crops and pasturage. Where such places had absentee landlords, the work was done by tenant farmers or *coloni.*

Still another type of *villa rustica* was a combination of summer home and farm run to pay for the upkeep of the place and to provide wine, and at which the owner stayed only in the season. In fact, the sites of many of these pleasure farms were chosen according to the season during which they were going to be occupied.

The Roman farmer knew and practised many techniques of farming and horticulture that the world forgot and had to rediscover—green manuring with vetch, seed selection, crop rotation, the use of compost, the preserving of manure, budding, grafting and pruning. Two of the methods of propagating olives described by Virgil are still in use. When transplanting cabbages, they fertilized them with seaweed. They blanched their lettuce by placing stones over it—and this white lettuce was a favourite *hors d'œuvre* at city dinner parties. They even had a skilful way of stripping the bark from cork trees, and this furnished the soles for the winter shoes of pretty Roman ladies.

So long as Romans were content with this simple rusticity, the nation prospered. Eventually the desire for display and the ownership of vast lands led them to a different sort of country living. The movement began when Lucullus went down to Cape Miseum, near Baiae, and laid out an elaborate place. Plutarch describes it. It was the sort of ambitious undertaking that caused other nobles to buy and build big country places.

This type was called the *villa urbana,* a place of several hundred acres on which was found the large house and so many outbuildings both for pleasure and work that each estate was actually a little town in itself. The main house usually took the architecture of a town house (hence the name *villa urbana*), and pronounced architectural design marked all the buildings and the layout of the grounds. Often little or no farming was done on this type of place, depending, of course, on the soil of the location. Thus the villas on the slopes of Mt. Vesuvius, where the volcanic soil was suitable for certain crops, were more apt to be *villa rustica;* whereas on the north shore of the Bay of Naples, where the rocky nature of the land prevented profitable farming, the places were apt to be more luxurious in the *villa urbana* style and maintained for pleasure alone.

As a superintendent or *vilicus* relieved the owner of actual management, and his wife, the *vilica,* saw to the women slaves, the owner had little else to do save to enjoy himself and the company of his friends. Often he had park lands for the chase and ornamental gardens galore. Some Romans became so wealthy that they could afford several estates, each with its own distinctive crops and fruit; and they travelled from one to the other as the particular fruit season or harvest came around, *villeggiatura,* a custom still practised by some of the ancient landed Italian gentry.

Generally this *villa urbana* consisted of two parts—the manor house with its surrounding gardens and, where farming was done, the farmhouse group, stables, barns, slave quarters, etc., with orchards, vineyards, olive groves and cultivated fields. The choicest sites were hill-sides, and the villa was located just below the top, with terraces extending down to gardens below.

The favourite localities for these villas near Rome were the slopes of the Sabine and Alban Mountains, at Tibur, Larentium, Sublaquem, now Subiaco, and the coast at Antium, Praeneste, Centumcella and Baiae. Praeneste, famous for the roses grown there for the Roman market, was the chosen spot of the Roman emperors to luxuriate in. At Baiae, Nero, Pompey and Caesar had their villas. One of Nero's pleasure places was at Sublaquem. Nero, Hadrian and Trajan also maintained hunting lodges high up in the slopes of the mountains. Some of the nobles even located their summer homes on the shores of the north-lying lakes—Garda and Como.

At Tibur—the modern Tivoli—were situated many of these splendid estates. Here was located Cicero's place, with its winter and summer residences, its great baths, grottos, waterfalls and decorative water-works. So abundant was the water that he called his place the Nile! He had for neighbours Pompey, Hortensius, Crassus, Brutus, Lucullus and the mother of Augustus. Later the Emperor Hadrian came there. Such was the Tibur "set."

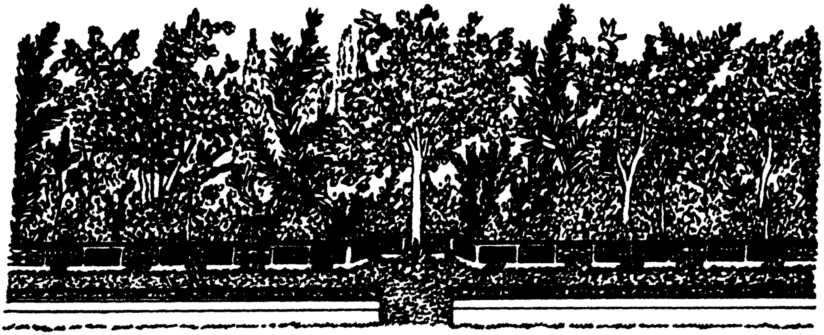
The extent to which money was spent on these places can be gathered from Hadrian's indulgence. Not only were the grounds laid out in the grand manner, but he kept agents travelling everywhere to buy Greek and Egyptian works with which to enrich the houses and the grounds. Those that he could not buy he had copied, just as some people today buy reproductions of famous antique statues for their gardens. Hadrian's reproductions included seven great temples, each typifying a foreign country. He even reproduced a romantic glen designed after the Vale of Tempe in Greece. The ruins of his Tibur estate can still be seen. It was only one of twelve he owned in various localities. Cicero was another passionate collector of garden statuary, with agents out scouting for good pieces. And he, too, had gardens enough to hold them, for he claimed to own no fewer than eighteen villas!

Pliny's Country Places

The two estates owned by the younger Pliny (62–116 A. D.), of which we have his accurate accounts, make it possible to take a mental walk around them. His seashore place was on the Tibur at Laurentinum, a short seventeen mile run down from Rome. It had a garden hedged with box and roses, fig and mulberry trees, a tennis court or *sphæristerium,* a long pergola with a sanded walk and, on a headland above the shore, a summer-house used for leisurely hours and for banqueting.

The larger estate was in Tuscany, 150 miles from Rome, where the village of Citta di Castello is today. Here he had a natural amphitheatre where he could enjoy mountain and forest views and had room for vineyards and a really impressive layout. As villas went in those days, his was a fairly simple place, but he reproduced in miniature all the features found on larger estates.

The house faced south, with a wide portico that opened on a terrace outlined with box and containing statuary called a *xystus*. This transition from house to garden seems to be one of Rome's important contributions to garden design. It was usually a stretch of lawn broken by round and rectangular flower beds that were edged with box or a low trellis. Here was also a fountain. Fragrant flowers were in the beds, violets especially being a favourite.



IN THE VILLA OF LIVIA WAS UNCOVERED A GARDEN ROOM WITH A WALL PAINTING

From this *xystus* of the Romans it is easy to trace the parterre of Renaissance times and the planted house terrace of today.

Note the statuary that Pliny has along his terrace. Romans had a weakness for garden statuary and they rode the hobby very hard. They set it in rows and alleys and groups. They used so much of it that in some gardens there was more stone work than planting. Pliny's uncle—the Elder—had mocked at those superstitious people who thought to ward off witchcraft and disease by setting up images of satyrs. Heroes were better, or an image of some god or goddess, he thought. It was a mighty poor Roman who didn't have some god in his ancestry. Plautus, the playwright, suggested that gardens be placed under the protection of Venus, and in many a Roman garden her statue presided. A man of culture, such as Pliny, would surround himself with works of art, not merely statues of the gods. Fragments of a few of these splendid statues have been recovered on his place. Doubtless on his terrace there was also a sun-dial, for, fully three centuries before, the time had been divided into hours and Papirius Cursor had erected the first sun-dial at Rome. That was in 293 B. C. It is natural to suppose that Roman gentlemen had these timepieces in their gardens. What an extensive heritage our garden sun-dial can boast—over twenty-two hundred years!

But we have lingered long enough in front of Pliny's house. Below the terrace came a stretch of lawn that led to the *gestatio,* where he took his "constitutionals." This had a circular form, with clipped figures and shrubs massed in the middle and a box wall on each side stepping up the slope. Outside this stretched a meadow.

At one end of the terrace a dining-room commanded a splendid view. Near it an outbuilding housed a private dining-room and bedroom, with its own portico and fountain. On this side you went to the *hippodromo,* or horse-pacing track. Quite a large open space it was, with straight sides and a semicircular end. Plane-trees stood around its edge, ivy was twined around the trunks and looped from tree to tree, and, to complete this green wall, box bushes clipped to obelisks were set alternately between the planes, with bay-trees behind.

From the curved end of the *hippodromo* you passed to a cypress copse of shady walks, with roses massed here and there in sunny open spaces. Beyond this, winding paths led to a formal layout of main walk and side alleys so lined with box as to form separate little green rooms (not unlike the box-walled apartments in the garden at our own Virginian "Brandon") furnished with realistic topiary groups of figures and fruit trees set out in a formal pattern. From this formality you passed to a naturalistic garden planted to knots of dwarf planes.

Below this spot formality appeared again. Here you came to a white marble semicircular alcove or *stibadium* made of four vine-clad pillars. The bench inside played a pretty trick: sit on it, and your weight started a spray of water! Romans were given to these water pranks, and their heirs, the Renaissance gardeners, raised them to a magnificent, complicated and, doubtless, annoying feature. However, fun was fun, and Pliny evidently let it go at that.

Below the alcove lay a large marble pool with a broad rim where he used to give *al fresco* suppers. Dishes were set along the rim of the pool and some were floated on its water. It wouldn't be at all a bad idea for estate owners today to use the rims of their pools for dining tables. After dinner, Pliny's guests could walk around a fountain that lay below the pool and take their ease on the couches in the vine-embowered marble summer-house that terminated the garden.

M. Terentius Varro's place at Casinum was another simple example of the country villa. Through the garden wandered a stone-margined stream fifty-seven feet wide with bank-side walks ten feet across and several bridges. A well-stocked aviary and fish ponds, a naturalistic grove of tall bushes and a classical rotunda of two rows of isolated columns were some of its other features. Varro was a very learned person and a great librarian. His best known work, "De Re Rustica" was written when he was eighty.

Of course, places such as Pliny's, Nero's, and Trajan's required large acreages; in fact, they absorbed so large an area that Cicero claimed the Roman farmer had no land left to till. The moralists of the age, as do moralists in all ages, railed against the extravagance. Seneca fairly froths when he protests against the way the lakesides and streams were being cluttered with villas. Land grabbing was a habit of the Roman nobility. They were land proud.

It is generally believed that these extensive estates were laid out by the same architects who designed the house and its dependencies. Today we employ architects for the buildings, and landscape architects for the grounds: the Romans considered the two—and rightly—as one art.

Eventually, as Roman legionaries pushed up the Rhine and through Gaul to Britain, country villas appeared in those far-flung hinterlands. Building was clearly one of the passions of the Roman aristocrat wherever he went. In England, for example, there have been uncovered five hundred Roman homes. Gardening, too, must have been a custom of their owners, for they introduced quite a number of trees and shrubs then unknown there. It was the Roman who brought the sweet chestnut, the lime, the walnut and the common elm to Britain. To him also is attributed the borage, chervil, chives, coriander, fennel, hyssop, iris, lupins, mustard, onions, parsley, rosemary, rue and southernwood and mulberries, figs, peaches, plums and quinces. Pliny called England "Albion" because of its abundance of white roses as well as the white cliffs of Dover.

Garden Maintenance and Methods

The making and maintenance of these large estates, of course, depended on slave labour, of which conquests provided an abundance. The *vilicus,* as we have seen, ordered the work of the slaves and, in spring and fall when work piled up, called in extra hands of *mercennari.* Under him was the tree-barber or *topiarius,* who attended to the fancy clipping of trees and bushes and the *vinitor* who took care of the vineyards. On big places there was also an *aquarius,* who had charge of the fountains, pools, waterworks, fish ponds and the trench dug around the garden to keep out stray cattle. Doubtless he was also responsible for the grottos, a fantasy of geological naturalism done with tufa rock and shells that Romans indulged in, sometimes turning them into quite large rooms, with fountains, that made cool retreats on hot days. Many estates, too, had aviaries and wild animal cages, a form of interest that appears to attract estate owners in all ages. Once let a man acquire sufficient acreage, and he will not rest until he has it stocked with wild fauna!

However, not all the Roman landed gentry followed the same scheme of estate layout. Some preferred the Greek idea of a private gymnasium—a playing ground converted into a villa and used for plain living and high thinking. Cicero had such a place and, being a pronounced Greekophobe, he called his villa at Pesteoli the "Academy," because it contained a portico for philosophic discussion. He had another on his place at Tusculum and a third he called his "Lyceum." Such gardens had their pillared halls, baths, libraries and museums. Egypt, too, bore its influence and, after Rome had conquered that country, it became the smart thing to refer to an artificial canal in a garden as a *Nilus.*

Perhaps it was one of the gardeners—or it may have been an owner himself—who discovered the art of forcing plants in heat. For the greenhouse, primitive though it was, first appeared in Roman gardens if legend is to be believed. Beginning as a pit, it later was elaborated into a building. As sheet glass was not known till the 3rd century, the roofs were covered with thin slabs of talc or mica. Fires kept burning around the sides supplied the necessary warmth. *Specularia* was the name given them. Here roses, lilies and grapes were forced. Tiberius, being ill, was ordered to eat cucumbers every day. He managed to obey the doctor's orders and astonish his friends with cucumbers all winter long from his *specularium*. Columella also suggested a way of forcing roses—when the buds show, dig a shallow trench close around the bush and fill it occasionally with hot water! Seneca believed that such unseasonable flowers, fruits and vegetables were to be condemned. "Live they not against Nature," he asks, "that in winter long for a rose, and by the nourishment of warm waters and the fit change of heat in winter time, cause a lily, a spring flower, to bloom?"

Early Roman gardeners made no distinction between useful and ornamental planting. Plutarch reports that lordly roses and choice violets were set side by side with humble leeks. Not until the time of the younger Pliny was any separation noticed.

Columella, in his ten-volume compiled work on Roman agriculture, suggests that a wall or hedge to assure privacy and protection should surround every garden, that it should contain a statue of the garden's presiding deity and, further, he divides its plants into three groups—those cultivated for ornament, those fruits and vegetables useful for food, and the herbs for seasoning and medicine. He names seventeen kinds of ornamental plants, twenty-nine vegetables, thirteen fruits, ten shrubs and twenty-three kinds of medicinal herbs. Among the flowers he would have Romans enjoy, and which we still raise, were marigolds, lilies, nigella, narcissus, roses, violets, snapdragons, wallflowers, asters, mallow and valerian. The herbs were practically the same we grow in herb gardens today.

In his time Pliny the Younger discovered twelve different kinds of roses cultivated in Italy, and enumerates nineteen different kinds of flowers suitable for chaplets and house ornamentation. In addition he suggests using eighteen kinds of chestnuts, eleven of myrtles, twelve of laurels, four of elms, three of box, twenty-nine figs and forty-one pears! Figs were the most cherished fruit in ancient Rome.

Virgil, whose farm near Mantua instilled in him a love of Nature and who roused his fellow Romans from their neglect of the land by his "Georgics," says that his favourite garden trees and shrubs are the bay laurel, the myrtle, the tamarisk and the viburnum. In the course of his writings Virgil mentions over 150 different plants.

Fruit Cultivation and Flowers

Among the first marks of garden civilization is the cultivation of fruit. To this the Romans were no exception. Cato's "De Re Rustica" (composed, it is said, for the instruction of his wife, who was evidently a farmerette!) mentions seven kinds of olives, six of grapes, four of apples, five of pears, six of figs and three of nuts as being cultivated in Rome. He also gave explicit directions for grafting. In time, Romans came to enjoy practically all the fruits we know today except oranges and pineapples, and the former were finally introduced in the 4th century. The four favourite varieties of Roman apples were the Manlian, Claudian, Pompeian and Tiberian. Quinces were also a popular crop.

Rome drew on every country it touched for varieties to grow in its orchards. Figs and almonds it brought from Syria, citron from Media, apricots from Epirus, pomegranates from Africa, apples, pears and plums from Armenia, Numidia and Greece, peaches from Persia, and cherries from Pontus. Lucullus is reputed to have introduced the cherry in 73 B. C. Wild strawberries, raspberries and gooseberries came from northern Italy. Very early in their gardening experience Romans learned to train fruit trees flat against walls—the espalier method still practised on the Continent and in England.

The most important fruit of all, one that played a lively part in the advancement of the Roman Empire, was the grape-vine. Pliny says that Italy opened up its hills and plains to the triumphal entrance of Dionysus between 130 and 120 B. C., and from that time on the progress of grape growing continued uninterrupted. As the crops increased, greater effort was made to induce the people to drink wine (the early Romans were water drinkers) and this bibulous education spread wherever Roman merchants and soldiers went. By the 1st century A. D., Pliny could state that "of the eighty most celebrated qualities of wine made in all the world, Italy makes about two-thirds." Wherever her ships went their holds were filled with it. She is said to have exported wine as far as India. In time Rome's prestige as a city began to grow among both Italians and foreigners because the best wines were to be had there. It followed, too, that with this prestige and increasing wine commerce, her wealth increased. And much of the wealth went to making and maintaining fine gardens.

In the heyday of their gardening fervour Romans paid high prices for exotic plants. The bakam wood from Judea, which gave a highly prized kind of incense, was exhibited in Rome as a great rarity by Vespasian and Titus—just as millionaires today exhibit rare orchids at flower shows—and rooted cuttings of it are said to have sold for several thousand sesterces.

This appreciation of flowers was a marked characteristic of Romans from the earliest days. Even the unpoetic Cato speaks of flowers having a refining and moral effect on the culture of people. Flowers were constantly mingled with Roman mythology and every goddess had her favourite plant. Venus, the anemone, poppy and violet; Proserpine, the narcissus and maiden-hair fern; Ceres, the willow; and, Juno, the lily, crocus and asphodel. It was natural, then, that Rome should have its flower festivals. During *Dies Parentalis,* the Feast of the Dead, February 13 to 22, and *Lemuria,* which came in May, tombs were garlanded; flour mills were decorated on June 8 and horses on August 21. Landowners placed flowers on their boundary marks on February 22 and at the Feast of Fontinalia, on the 13th of October, fountains and wells were crowned with flowers. The great Spring festival was Floralia, celebrated with extravagant merriment from April 28th to the 3rd of May.

A GARDEN ROOM WALL PAINTING FROM POMPEII

Eventually flowers became a necessary commonplace in the life of the people. Large nurseries in the Campagna supplied the city. Just as housewives in Europe today save a bit to buy a nosegay of flowers at the market when they purchase the day's vegetable supply, so did many a Roman matron go short on the housekeeping money to indulge herself in posies. Guests at dinners wore garlands of flowers tied with linden to prevent intoxication (which they could have more readily prevented by not drinking so much!) and the servants, drinking cups and walls of banquet rooms were also flower-decked. Cleopatra, it is said, covered her banquet floor eighteen inches deep with rose petals and had her mattress stuffed with them. Nero gave many a banquet at which the floor was ankle deep in flowers and his guests were showered with petals and sprayed with mists of perfume from the ceiling. At the theatre, garlands were tossed to actors just as flowers today are passed across the footlights.

But for all their common usage, flowers did not lack respect. Garlands were worn indoors, never in public. So sacred were they once held that a law punished those who dared use them irreligiously. Lucius Fulvius, a well-known banker of his time, served sixteen years in prison by order of the Senate for appearing on a balcony with a garland round his head. Perhaps there were contributing causes to this punishment—remember, he was a banker!

The excesses to which the late Greeks went in the use of perfumes were mild compared with the indulgence of the Romans. A law was passed restraining them, but the people gave little heed to this prohibition. The Vicus Thuriacus in the Valebrum at Rome became the perfumers' quarter and their shops were the meeting places of Roman society. At these *myropolia,* they sampled perfumes and bought the scented oils and unguents to fill the shelves of the *unctuaria* or ointment rooms in bath houses on their estates. Oils, ointments and powders, made up in many colours, to suit different complexions, were considered essential to the life of the smart Roman. Susinum, made from the lilies of Susa and sundry herbs and gums, was one of their favourites.

The Decline of Roman Gardens

While it would be unreasonable to lay the downfall of Rome to such luxuries as flowers and perfumes and elaborate country places, yet they definitely contributed to the weakening of the fibre of those who should have been leaders of the nation. The old farm life of their ancestors was stodgy and thrifty and dull. They were well off and safe. These Romans of the end of the Empire craved idleness, luxury, excitement and change. The life on their great places was self-indulgent and frivolous. Most of the owners lacked public spirit and were so wrapped up in class pride that the good of the common people never entered their heads. When an upper class neglects to cultivate the land for necessary food crops, and gives it over to landscaping and pleasure alone, trouble lies ahead. The luxury found on Roman estates in the 4th and 5th centuries indicated a decline in the character of the people. These landowners teetered on the crumbling edge of an empire that lay between a dead civilization and an impatient barbarism. Only invasions from the north were needed to finish it.

In 410, Alaric, the Goth leader, and, thirty-five years later, Genseric of the Vandals, pillaged Rome. On their approach owners abandoned the villas and fled into towns and cities for safety. A few seasons, and their magnificent gardens had fallen into disrepair. Although the invaders gave to the torch much of Roman civilization, be it said to their credit that many of Rome's best monuments and villas they left untouched and that in their own building they strove to follow the patterns they found. Theodoric restored the imperial gardens at Ravenna, and Totila took over Hadrian's estate at Tivoli.

The Dark Ages, which succeeded these invasions are generally calculated to extend from 500 A. D., on the fall of Rome, to the final extinction of the Eastern Empire by 1500 A. D. Through the 10th and 11th centuries agriculture lay under a withering depression. Yet the darkness was not so dark as painted. For several centuries the light of horticulture and gardening was carefully tended within the sanctuary of monastic walls in the west, where farming orders followed the agricultural instructions of the 5th century writer, Palladius; and from the east came an art of gardening that was to leave its imprint on south-western Europe, for the brightest light in the Middle Ages—the light in science, medicine, philosophy and poetry—was to burn in Arabian Spain.

Gardens in the Eastern Capital

The capital Constantine built on the Bosphorus emerged as the swirling centre of both eastern and western influence, of Greece and Rome and the overpowering culture of south-western Asia. The high terraced garden, first made a fashion in the ancient days of Babylon, was found here, and the hunting parks and polo fields as well. The pleasure garden surrounding even the hunting lodges had a formal pattern of beds disposed around a central tank and its side canals. Sometimes a middle canal was made an axial feature, with planting each side of it, a style that the most recent of German modernist garden architects are reviving today. The Emperor Justinian was so ambitious to enrich his garden that he even tore down a church to make way for a fountain.

Water, of course, was an essential in this climate, and not alone did the private gardens have their swimming pools but there were also many for the public. When women took to bathing in the public pools, St. Chrysostom hurled his invective against them with such success that for a woman to bathe openly in a public tank was considered sufficient grounds for a divorce!

Most of the private gardens were either in or immediately near Byzantium, as Constantinople was called, for the distant country place was kept as a convenient retreat for discreet retirement when its owner fell out of favour with the Court.

As the Roman Empire in the east crumbled before its invaders, more and more of the Asiastic influence becomes apparent in the gardens—first the Persian, then the Arabian. Especially could this be marked by the extravagant use of jewelled trees within the courtyards and other precious and amusing mechanical imitations of Nature.

Among these many Persian refinements was the kiosk or garden pleasure house, which was set apart from the other buildings and often surrounded by canals and groups of dwarf palms, their trunks bound in teak planks held together by gilded copper rings. Sometimes these dwarf trees were made into fountains by running a pipe up the trunk to the top from which the spray cascaded down the leaves. These Persians clipped their bushes into letters, texts and figures—an importation of the Roman *ars topiaria*—and were given to usual types of grafting, by which several kinds of fruits were made to grow from the same trunk. They introduced peacocks and other decorative birds into their gardens and they specialized on growing melons and interesting fruits. Their sense of the amusing (or perhaps it was the search for peace) induced them to build little summer-houses up in the branches of large trees. Truly they made gardens to live in.

The science of medicine and the use of herbs in its practice was carried into Persia by Nestorian Christians, who made their medical centres first at Gondisapur and then at Bagdad. With them they took along many popular Greek medical works which they translated and to which they added records and pictures of more familiar plants of the neighbourhood, thus adapting these works to practical purposes. As early as 1011 an Arabic version of the materia medica of Dioscorides was presented to the Mashbad shrine. It was illustrated with six hundred seventy-seven figures of plants in the contemporary miniature style.

When the Arabs in turn swept over this region, they succumbed to the luxury of gardens as had many a people before them, and eventually evolved their own type. It was an enclosed court with a fountain and marble-paved paths shaded with vines. Sometimes the entire court was paved, the only vegetation being trees in tubs set about the fountain and around the edge of the court. They clipped shrubs, too, into decorative designs, shaped up their myrtle and bay hedges, draped their trees with vines and planted their beds to fragrant flowers. Thus in shady bowers, with the music of water and the scent of blossoms filling the air, they lived their pleasant outdoor life.

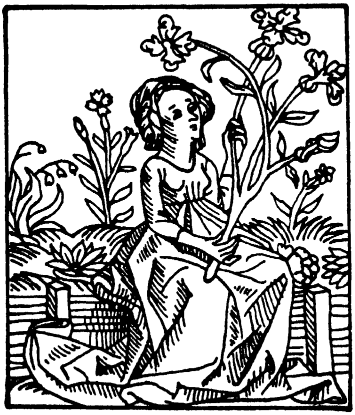
Eventually the day was to come when this Arabian control fell asunder and the Turks swarmed forward. Venice and Vienna were to be gateways of new plants coming into Europe. Under the flower-loving Turks the Levant grew to be a storehouse of new and useful garden flora. Some of it travelled to Europe by the lanes of commerce, some was carried home by returning Crusaders.

CHAPTER VI

MONASTIC AND MEDIÆVAL GARDENS

WHEREVER the religious and the clergy congregate, there you find gardens. From its beginning the Christian priesthood managed to mingle with its devotions a practical turn for agriculture. The rigorous cenobites of Egypt cautiously alternated prayers and the cultivation of their vegetable patches, tree grafting and bee culture. St. Jerome (343–420) tells of the gardens Anthony made in the fastness to which he fled, and this same Jerome admonishes a young monk, "Hoe your ground, set out cabbages, convey water to them in conduits." St. Augustine evidently had a predilection for gardens. St. Benedict (480–544) in writing his *regula* for the guidance of the monasteries of the order he founded in 529 at Monte Cassino, a document that has served as the pattern for many a monastic establishment since, made definite provision for cultivating the soil. Fruit, vegetables, bread and wine were to compose the diet, work in the fields was provided for in the daily schedule, and the rule further states that "the monastery ought, if possible, to be so constituted that all things necessary, such as water, a mill and a garden and the various crafts, may be contained within it."

This monastic gardening served many purposes. It provided food for the table, flowers for the altar, and herbs for healing the sick. In making it take a part in their daily lives, the religious also accomplished another worthy end—they preserved the art and technique of horticulture and gardening while the rest of the country-side, harried by wars, was forgetting and neglecting it. In some monastic houses the abbot taught agriculture and husbandry to the farmers of his neighbourhood; he served almost the same purpose in his locality as an instructor at an agricultural experiment station serves today. In many places, the monastery garden carried on strains of fruits and vegetables that might have been lost. Likewise monks played no small part in the distribution of plants, for in going on pilgrimages from one shrine to another and travelling between monastic houses, they carried along new varieties and much plant and horticultural information.


A TURF SEAT OF 1480

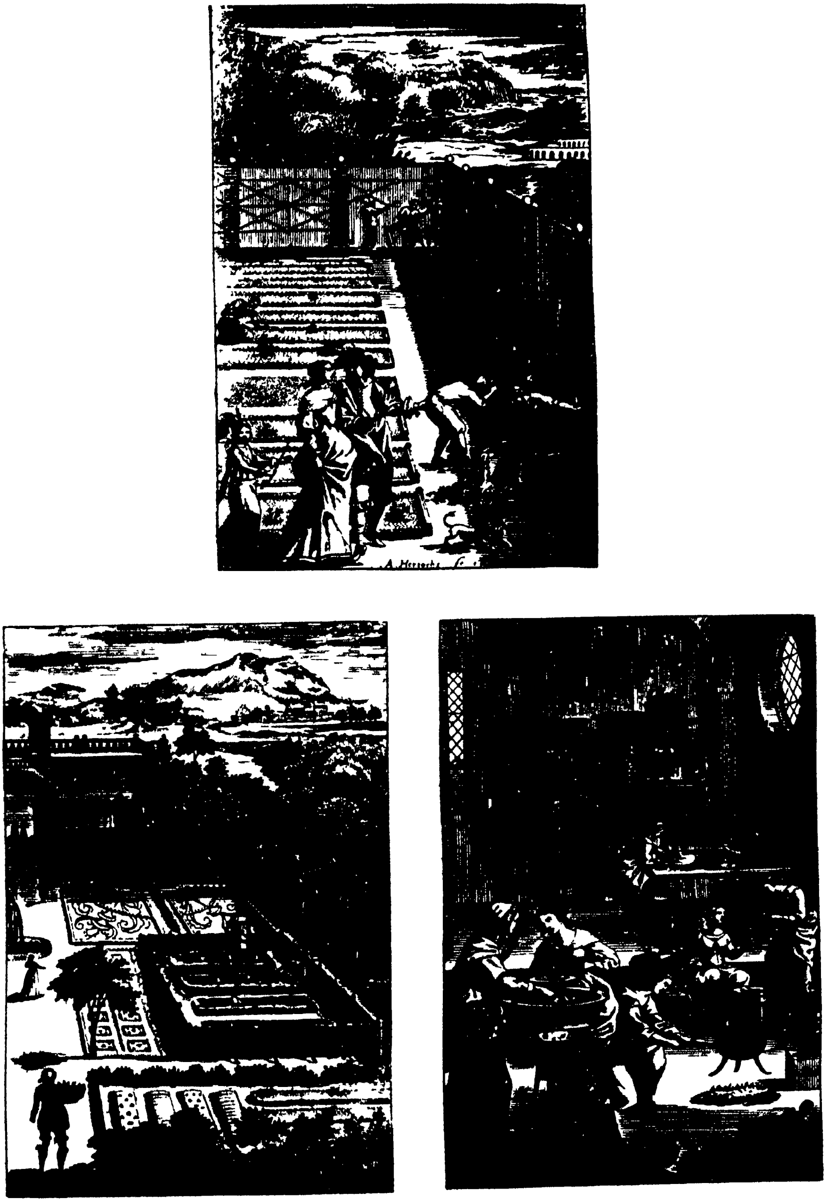
Through mediæval times the old Roman diet of vegetables gradually was supplanted by a meat diet. Vegetables such as the Romans had formerly enjoyed were not commonly re-introduced until the Renaissance, and England did not see them in popular usage until well over a century later. Since vegetables formed a large share in their diet, the clergy doubtless had a hand in this dietary revival.

Fruit also was a favourite monastic crop. The orchard, or *pomarium* provided apples, pears and cherries for eating, grapes for wine, and cider in countries that could not ripen the grape. Many a fruit bore its monastic association long after the mediæval monasteries had crumbled away. The Wardon pear, famous for centuries in England, was originated at the Cistercian monastery of Wardon in Bedfordshire. In Italy, Spain, Germany, France, Flanders, and England, where the monastic houses flourished, the cultivation of vegetables and fruits eventually attained a high standard. This monastic interest in fruit extended even up into the 18th century and later. Le Gendres, curé of Hermonville, in 1652, wrote "Manière de Cultiver les Arbes Fruitiers," and, in 1653, Triguel, prior of St. Marc, wrote "Instructions pour les Jardins Fruitiers."

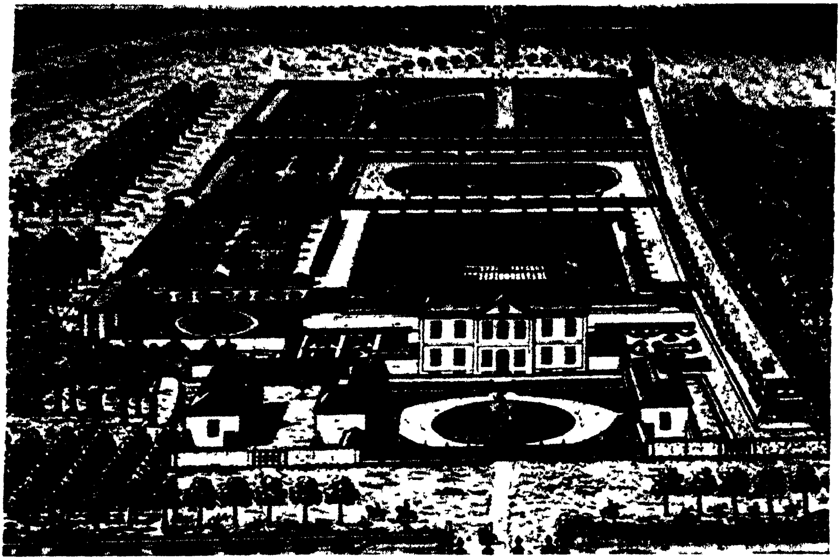
The Gardens of a Monastery

The gradual evolution of monastic buildings was conducive to garden making. Those of the western church first followed the lines of the Roman villa—atrium and peristyle, a courtyard with a surrounding colonnade, subsequently re-named a cloister. The central fountain was there and the beds of flowers and herbs, but statues of Christian saints supplanted pagan divinities and emperors. Even in the East, where the religious dwelt in separate huts or cells, each with its little garden, the cells were grouped around a central court. The open pillared court at the west end of Christian churches was often faced with a garden. Sometimes paved, sometimes planted with trees and flowers, sometimes used as a burial ground and sometimes a place for meditation, these front courts took the eastern title of "Paradise," and were sanctuaries into which the wicked and good alike could flee and be safe.

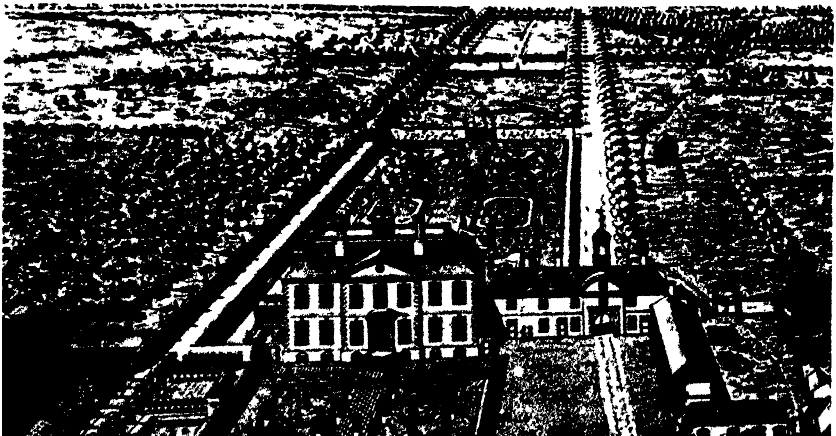
From these simple courtyards, monastic establishments often grew into extensive groups of buildings and enclosures. It was not uncommon for the abbot himself to draw the garden plans. Thus Brithnod, abbot of Ely, a celebrated gardener and grafter of trees,



TWO GARDEN VIEWS AND THE INTERIOR OF A LADY'S STILL-ROOM, FROM JOHN EVELYN "THE FRENCH GARDINER," 1672



SQUERRIES AT WESTERHAM, KENT, SHOWING THE ENTRANCE COURT, HOUSE AND DEPENDENT BUILDINGS ALL COMBINED

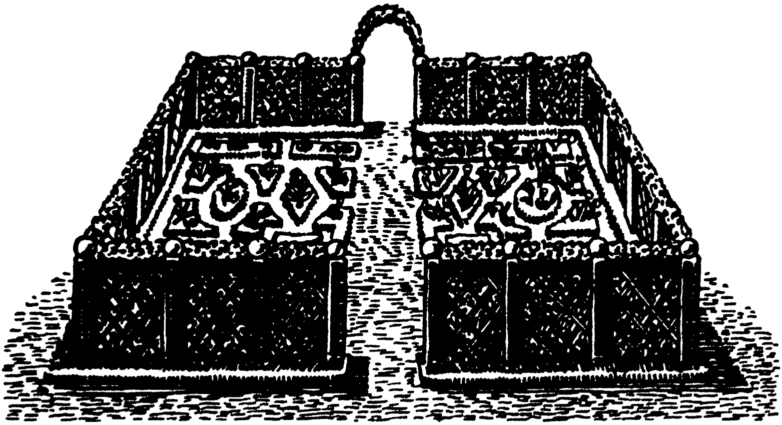


MOUNT MORRIS, WESTENHANGER, KENT, SHOWING THE FORMAL LAYOUT OF GROUNDS IN THIS ERA laid out extensive gardens and orchards, and first gave Ely its fame for grapes. We have fragments of plans of several of the English establishments, such as Norwich Priory and Abingdon Abbey and those of Canterbury showing the trees near a fish pond and the indication of an orchard and vineyard. The best preserved and most complete of all these plans are those of St. Gall, a Benedictine establishment near the Lake of Constance.

A WATTLE FENCE AND PUMP OF 1508

The St. Gall plans, reputed to have been drawn by Abbot Eginhardus, Prefect of the Royal Buildings under Charlemagne, present the idealized notions of what their designer hoped the place would eventually be, rather than what actually existed. They divide the area into four parts—a physic garden, a cloister garth, a vegetable garden and a combined orchard and burial ground. The physic garden or *herbularis* had sixteen straight, raised beds divided by a main path and with plants around the base of the walls. A patterned garden, this, the type from which the patterned parterres of Renaissance times, and later, doubtless descended. This *herbularis,* conveniently placed near the doctor's office or infirmary, was so located that the sick could look out upon it. The cloister garth or garden was a square plot with grass and shrubs, traversed by intersecting paths whose crossing was accentuated by a central fountain. Another plot was the burial ground, set with fifteen kinds of fruit and other trees in an orderly fashion. The kitchen garden had eighteen straight beds in a square and contained the vegetables that Charlemagne, one of the most active of kingly gardeners, listed in 812 in his "Capitulare de Villis Imperiabilis," the catalog of plants he ordered to be cultivated in his dominions.

Incidentally, Charlemagne (742–814), viewed from the interest of the farmer and the gardener, was an outstanding figure of all time. A good, Nordic business man, he ran his farms as he ran his empire, on a well-thought-out system. He maintained palaces at Aix la Chapelle and at Ingolheim on the Rhine and various other large estates. Not until he had his places running successfully did he go into those regal luxuries, such as Oriental menageries and all that fantastic display for which he is mostly remembered. His capitulary contains directions for the care of orchards and lists of trees and plants to be cultivated—mainly fruit trees and medicinal herbs, together with a few ornamental plants. These lists not only served as guides for the occasional estates that did have gardens in those days but, as we have seen, guided the gardeners of monastic houses.



A RAILED GARDEN OF 1640, SHOWING THE PATTERNED BEDS

The sacristan in these monastic establishments often had his special plot, the *gardina sacristae,* where he raised flowers for the altar and for the *coronae sacerdotalis* or wreaths worn by priests on feast day processions and with which candles and banners were decked. Sometimes these sacristans' gardens were planted near churches and chapels to which no monastic house was attached. Henry VI of England left to Eton a piece of ground between the church and the cloister for this particular purpose of growing flowers. In many foundations the abbot had a garden of his own, often with a dove-cote in it. The larger English establishments developed fish-breeding ponds to provide the Friday and Lenten fare. Some of these "fish stews" still serve as landscape features in old English gardens.

The garden—its orchards, vineyards, moats and ponds—was in charge of a garden warder or *hortulanus,* who had assistants called *famuli.* Because of the great numbers they housed, many of the monasteries tilled large acreages outside the enclosure, as land was given them. Such farming was carried on either by the brethren or by hired labour. Sometimes even the *hortulanus* came from the outside. This extramural land of the monasteries was father to the glebe land that surrounded many English churches, and from the tithes of which many parsons once derived their support.

The Orders as Gardeners

The Cistercians, founded by St. Bernard, laid great stress on manual labour. He encouraged agriculture and horticulture, and his followers raised numerous flocks, and cultivated fields. That their gardens might be conveniently watered, they generally located them on rivers. The regular brothers did the field work, assisted by lay brothers or *conversi,* who were usually too ignorant to take a part in the leading services at the abbey; they repeated the offices of Sext and Nones—which came during working hours—in the fields with the monks. So engrossed with outdoor work were the Cistercians that they moved the well from the centre of the cloister garden to the corner nearest the refectory, so that they could more readily wash up before meals! Great gardeners, these Cistercians! In 1533 the General Chapter at Cisteaux sent a commission to Scotland to reform the monks of Melrose Abbey who, among other offences, were charged, each man, with having a pleasure garden of his own! The record suggests that these monkish gardeners defended themselves ably.

A GARDEN GATE AND FENCE OF 1495

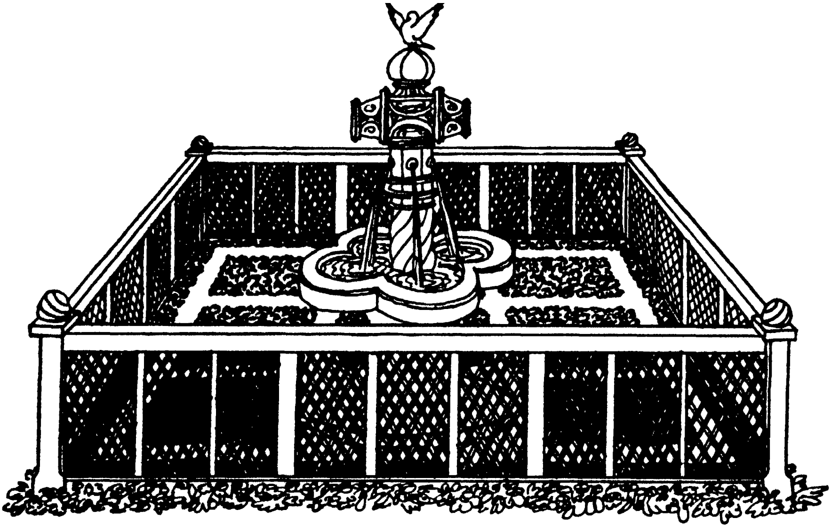
When the Carthusian Order arose in 1084, following St. Bruno's strict rule of silence and solitude, each monk was assigned his separate hut. Two centuries later the Order conceded each hut a garden, the cultivating of which provided the monks with recreation. Though this scheme altered somewhat the old Roman villa plan, which most monasteries had adopted, the Carthusians grouped their huts around a central cloister.

Even those orders that were forbidden to do farming had gardens of some sort, the garden of medicinal herbs being considered a necessity. Up to the 12th century medicine was commonly practised by monks. At Monte Cassino, the Benedictine birthplace, the study of medicine was pursued piously, giving competition to the school of medicine at Salerno, a neighbouring town, that Charlemagne founded. Since the latter included Jews and Moslems among its scholars, it was very much a secular institution. It gave Europe its first university, a centre of learning that prospered and then declined until Napoleon gave it its congé in 1811. The Church meanwhile resigned its ancient claim on the bodies of men very reluctantly. "To consult physicians," said Bernard of Clairvaux, "benefits not religion." However, so many abuses arose through monks practising medicine that the Pope was obliged to forbid it. Nevertheless the knowledge and use of herbs was still held an essential duty by the religious and secular clergy alike. And this interest helped to preserve botanic learning and to carry on the therapeutic heritage handed down from pagan healing temples. Monks who were botanists and physicians combined were not uncommon.

Botanical Writers

Since the religious were the authorities on botany and medicine, it naturally followed that they should write many of the early books on these subjects. The botany of mediæval times was based on the lines of Aristotle as set forth by Theophrastus. This lineage is interesting to trace. In the 9th century, for example, one Hrabanus Magnentius Maurus compiled a famous plant encyclopædia. Much of his information he culled from the 17th book of the "Etymologiae," written by Isidore of Seville, archbishop from 600 to 636, and one of the great encyclopædic scholars of the time, whose writing influenced many lines of thought from the 7th to the 10th century. Isidore had taken his information from the Elder Pliny's "Natural History," and Pliny, in turn, had gathered much of his from Theophrastus' "Inquiry Into Plants." Thus from a pagan philosopher—and botany was considered a branch of natural philosophy for many centuries—descended this 9th century Christian tome.

The honours for writing the first known gardening book in mediæval times falls to Walafrid Strabo of Suabia (807–849), abbot of Reichenau, famous botanist-physician and biographer of Charlemagne. The twenty-seven poems in his "Hortulus" each contains a description of a plant he grew in his garden—sage and rue and southernwood, poppy, pennyroyal, mint and parsley, gladioli, lilies and roses—which he tended lovingly, watered sedulously and for whose existence he fought against weeds and nettles. His favourite flowers were roses and lilies—"better and sweeter are they than all the other plants, and rightly called the flower of flowers." A real dirt gardener, Strabo speaks in terms we can all understand: "Part of my garden is hard and dry under



IN CASTLES WHERE SPACE WAS LIMITED THE GARDEN WAS OFTEN RESTRICTED TO A LITTLE RAILED AREA OF BEDS AND A FOUNTAIN the shadow of a roof; in another part a high brick wall robs it of air and sun. Even here something will at last succeed." He also suggests many remedies that could be made from flowers, his favourite specifics being oil of roses and horehound tea.

The standard medical and plant book of early mediæval times was the "Herbarium" of Apuleius, which existed in manuscript form for many centuries and was finally brought out as a book in the 15th century. England had an even earlier work—the manual of a Saxon doctor, called "The Leech Book of Bald," and in the 12th century students consulted Macer's "Herbal," a popular treatise on plants. England's first practical gardening book was cast in verse form—"The Feate of Gardening," by Ion Gardener, who tells of plants in 15th century English gardens and how they were grown.

In his writings the Venerable Bede includes much medical lore as practised by English monks of his day. The two earliest English writers on gardens and plants were both ecclesiastics: Alexander Necham (1157–1217) and Bishop Grosseteste of Lincoln (1175–1253). Necham, an Augustine monk and abbot of Cirencester in 1213, wrote "De Laudibus Divinae Sapientiae," a poem in ten books, of which the seventh is devoted to herbs and fruits, and "De Naturis Rerum," which is concerned with laying out gardens. Bishop Grosseteste was an ecclesiastic famous for his medical knowledge and healing skill. He adapted Palladius' work, "De Re Rustica" to English conditions—a volume, widely read, that affected horticultural practices for two centuries. In the 15th century a monk of Westminster, Nicholas Ballard, transcribed Palladius' instructions for grafting and setting out trees, thus spreading the knowledge of this art to all and sundry.

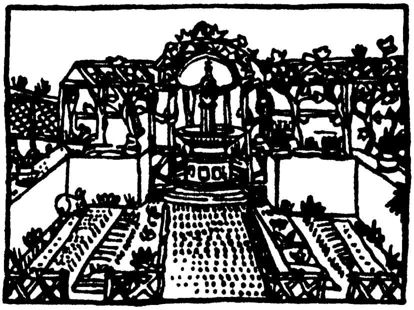
Three other names stand out in this pantheon of botanical and horticultural leaders—Albertus Magnus (1193–1280), Otto Brunfels (1464–1534) and Bartholomaeus Anglicus. Albertus Magnus, a Dominican, one of the greatest of mediæval scholars, wrote learnedly on plants. Legend says he did even more: he revived the Roman practice of forcing fruits and flowers in a hothouse. So unusual was this, and so successful his under-glass gardening, that many suspicious people charged him with witchcraft.

The first German herbal, "Herbarium Vivae Eicones"—Living Pictures of Herbs, 1530—was composed by Otto Brunfels of Mayence, a Carthusian monk who later turned Lutheran and lived to be successively a physician, schoolmaster, preacher and commentator on the Scriptures.

The first printed original treatise on herbs composed by an Englishman was "De Proprietatibus Rerum," by Bartholomaeus Anglicus, a member of the Minorite Order and a learned theologian. His 17th book he devoted to herbs, and from his descriptions one gathers that he himself gardened and knew his plants well. His botanical and medical heritage is traceable to Aristotle, Dioscorides, and Galen, the great Roman physician. This book, written about the middle of the 13th century, was translated into English in 1398 by another cleric—John de Tervisa, chaplain to Lord Berkeley. Through the Middle Ages it was the popular source of information on natural history.

Instructions for Ladies

In addition to instructing neighbourhood farmers, the religious establishments, the nunneries especially, taught still another class —ladies, who there were schooled in the use of herbs and the making of simples for the care of their households. Such knowledge was considered part of the essential education of a lady, for women did the family doctoring. As physicians weren't handy in those days, the women had to physic and patch up their knights who were constantly getting banged up in jousts or coming home sick from the Crusades. A few venturesome females even dared to practise medicine, but they were promptly put in their place. From this custom it is easy to see how "a becoming and honourable herbary" grew into a necessary feature of mediæval castle grounds. The plants the housewife grew were not merely pot herbs used for flavouring sauces and meats; they also included many of the flowers—honeysuckle, lavender, lilies, marigolds, poppies, periwinkle, peonies, roses and violets—which were necessary ingredients in the compounding of medicines and the distillation of flower waters. Both in England and France the still-room, presided over by the lady of the place, became part of every well-equipped household.


AN ITALIAN GARDEN OF 1492

Such gardening as the restricted grounds of a walled castle permitted was always under the direction of the mistress. With her kirtle tucked up and her wimple awry, she was as active a gardener as many a lady today. This is coming a long way, of course, from that primitive woman who made her garden with a digging stick and induced her man to quit roving. The mediæval mistress, however, was not always so successful with her men-folk, who rejoiced in wars and crusades, and even in days of peace were away hunting much of the time. In all ages we shall see gardening classed as a domestic art and under the guidance of women. And in all ages most of them have a hard time interesting their husbands and sons in it.

Since mediæval or middle age times may be said to extend roughly from 500 to 1500 A. D., we can expect to see many gardening changes in that stretch of a thousand years, changes which begin with the simplest growth of gardens beyond castle walls and which end in elaborate developments, such as the terraced garden built on the Seine in 1523 at Saint Germain-en-Laye, with its grottos and sculpture, and the Villa D'Este, laid out in 1549 for Cardinal Hippolito, at Tivoli, on the site of the Emperor Hadrian's villa.

Gardens Grow with Peace

The first influence to affect gardens was the rise of safety in living. Gardens grow with peace. Whereas the monastery was immune from attack even in a low-lying, fertile valley, for safety's sake the early mediæval castle was set on a high hill. Being little more than a fortress, it could spare practically no space within its walls, except the courtyard, to accommodate a garden. As the country-side became safer, gardens were planted outside the walls on the land between the wall and the moat, and, gradually, they crossed the moat.

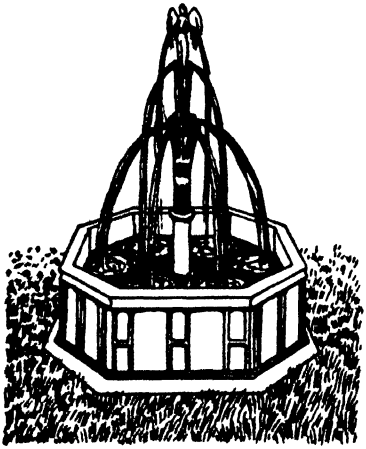
For safety's sake, in early times the burgher dwelt behind the town walls, and so close together were the houses built that gardens were not permissible. He had to be satisfied with a vine or two and a fig-tree. Sometimes, venturing beyond the walls, he cultivated the land immediately outside them, selling his produce in town, but such fields were always a temptation to brigands and raiders. To this custom there were exceptions, especially in the larger cities. Some Paris citizens had their flower and vegetable gardens, as we find them described in a 14th century book, "Menagier de Paris," and London was famous for its town gardens. Fitzstephen said, "on all sides outside the houses there are adjoining gardens with trees both spacious and pleasing to the sight." In the 13th century, St. Louis laid out a garden on the end of an island in the Seine near Paris, and at Nuremburg, Frederick II made a terraced garden supported by arches, not unlike the Hanging Gardens of Babylon.

With the coming of peace, a countryward movement began, cities extended beyond their walls, suburban areas blossomed with houses and gardens and even the burgher had his patch of onions, leeks, garlic and cucumbers flourishing safely behind its hedge or fence. Unmolested, the small farmer tilled his land near the country manor house.

A GARDEN BATHING SCENE OF THE EARLY 15TH CENTURY

In some sections life became so secure that hunting parks were preserved and stocked with game. Here the rich landowner would set up his shooting box, although rarely in these days did he attempt a garden around it, as did the Persians on their hunting preserves.

Not only did safety at home affect gardens, but also the adventuring spirit that led men to take to the highroads influenced gardens and gardening. The most ambitious travelling ventures of these mediæval times were the Crusades, followed by a mania for pilgrimages, and for the wanderings of scholars, from which these various travellers often returned home laden with strange plants. Damask and Provence roses, oleanders and pomegranates and other new trees and shrubs the Crusaders are said to have introduced. Legend says that St. Louis brought the ranunculus to France from the Holy Land when he returned from his Crusade. It is also possible that the Crusaders caught the fever for grafting in the Levant, for the Saracen gardener was never happy unless he was grafting a rose on an almond or some other such horticultural feat. Grafting became a common practice in the latter years of the Middle Ages.


IN MEDIÆVAL TIMES THE FOUNTAIN WAS THE CENTRE OF GARDEN INTEREST

Another benefit the Crusaders brought home was a fresh conception of what gardens ought to be. Accustomed to little patches within castle walls, they were fascinated by the size and beauty of the gardens they saw in the Levant, and, returning to their homes, they began enlarging and enriching their own gardens. And more—they began living in them. In them they held their games and their tournaments. They set up tents. They ate their meals. They sat and sprawled on the flower-spangled turf and enjoyed the music of birds and the tinkle of water in the fountain. Once more the East was teaching the world the civilization and luxury of gardens.

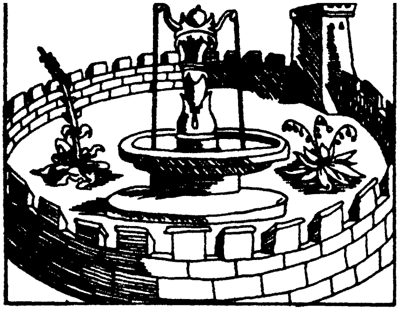
Domestic Gardens of the Middle Ages

As it was subsequently evolved, the garden of the Middle Ages had two divisions—the herb or kitchen-garden and the orchard or pleasance. The first contained medicinal herbs and a few vegetables for the family's use; the second included trees and flowers. One was utilitarian, the other decorative, although a garden made for beauty and pleasure alone, as we make them, was a later development, not appearing on the Continent until the 15th century and in England until Queen Elizabeth's time. Of course, even then for a very long while only rich landowners could afford a garden for beauty; the commoner was satisfied if he had a garden for use.

Many of the herbs grown in these kitchen-gardens we would class as flowers. Violets were a regular item on the menu—they were chopped up with onions and lettuce for salad, or cooked with fennel and savory for broth. Stewed roses and primroses was the sort of choice dessert a hostess would boast about. Of the plants Charlemagne ordered to be grown in his gardens in 812, only two—the rose and the lily—we would consider flowers. On the other hand, by the 14th century the earliest English garden planting list—Ion Gardener's "The Feate of Gardening"—suggested ninety-seven plants, of which thirty-nine were flowers. Thus the end of mediæval times saw a growing appreciation of decorative plants. Most of these, however, were not the highly hybridized kinds we grow, but rather wildlings brought in from meadow and hill-side. As flowers increased in popularity, interest in herbs declined, or, rather, herbs were relegated to the realm of science and made subjects for botanical gardens.

This interest in flowers as flowers brought about another change —whereas once they were grown together with vegetables and herbs, the dawning of the Renaissance saw the two separated, *since it was no longer felt good taste to force* the company of the lowly onion on the regal rose. The making of nosegays and garlands grew to be one of the pleasant duties of the housewife, for which she tended her special beds of roses, lilies, peonies, pinks, marigolds, violets and periwinkle. Here she collected her seed, and, even as you and I, exchanged it with neighbours. Surely flowers once more were assuming a part in the cultural life of the people.

The orchard, too, enjoyed a gradual evolution from a flowery meadow, shaded with trees and cooled by a fountain, into a pleasance. The 16th century found this well accomplished —a "fayre garden, replete wyth herbes of aromatyck and redolent savours, with a poole or two for fysche." The flowers that decorated it at first were such as spring up naturally in grass. In its later stage flowers were cultivated, among them columbines, lavender, iris, roses, lilies, pinks and peonies. The first orchards contained a mingling of fruit and forest trees. In time, and according to location and climate, they would contain almonds, apples, cherries, chestnuts, figs, grape-vines, hazelnuts, mulberries, pears, peaches, plums and walnuts. In addition there were set out separate orchards for growing fruit. England could display well-established and extensive orchards by the 14th century, and fruit entered the diet of both rich and poor. Gradually the varieties of fruits increased. By the middle of the 16th century England was enjoying the apricot, and had begun cultivating strawberries,


AN EARLY MEDIÆVAL WALLED GARDEN

raspberries and gooseberries. This era also saw many new vegetables introduced into English kitchen-gardens, among them artichokes, asparagus, horseradish, melons and tarragon.

Both the kitchen-garden and the pleasance were encircled by high protecting brick walls, and each was eventually further divided into little rooms or sections. As it first appeared, the pleasance of the castle or fortress-like country house, was laid out at a distance from the building and bore no architectural relation to it. It was a thing apart, hidden behind a wall, to which entrance was gained only through small locked gates, one from the house, the other opening on the meadow or orchard.

Inside this wall lay the garden. Circular in shape, this was literally a garden within a garden. Its boundaries were marked by a low wall of stone, brick or daub, or a low paling or wattle fence, or trellis work or hedges of thorn, privet, sweetbriar, or yew clipped square. Inside this circle still further divisions were made by low lattice, which was sometimes painted and occasionally gilded. Red, blue, green and yellow were the favourite colours, or an owner might use only the colours on his coat of arms.

Around the outside walls ran flower beds raised one to two feet above the ground by bricks or planks. Sometimes they were supported by stones. Or the beds were laid out in a pattern in the middle of the pleasance, into a checker-board of squares and oblongs. The paths, usually sanded, were bordered by flowers held in place with stones or animal bones or tiles. One feature especially marked the planting—it was very sparse, much as we set out specimen plants today. Gardeners in those times believed that too many plants in the beds would rob near by trees of nourishment. Often the plants were not actually placed in the soil, but were grown in pots of earthenware or metal and set on the beds.

Garden Ornaments

An essential feature of the garden was its fountain, placed in the middle, and simple or elaborate according to the owner's purse. Later, Francis Bacon, in his essay on gardens, was to divide them into three kinds—"the one that sprinkleth or spouteth water, the other a fair receptacle of water some thirty or forty foot" and the third, "which we may call a 'bathing pool.' " From the East the Crusaders brought home this notion of a bathing pool, and outdoor bathing became the rage. Sometimes these were quite extensive shallow pools approached by steps, and sometimes the provision for bathing was nothing more than a tub. This gave rise to a dainty custom—ladies dabbled their pretty hands and feet in a garden pool before meals, and at other times, discreetly accompanied by their maids, even plunged in. We find them pictured in many a mediæval painting; and if the pictures are to be believed, they thoroughly enjoyed playing Susannahs.

Close-clipped and rolled lawns, as we know them, rarely found place in mediæval gardens. The tall growth may have been scythed occasionally, and Albertus Magnus speaks of a lawn "carefully weeded and trampled under foot"; but people apparently preferred to sit on the flower-starred grass, such as you see in pictures by Sandro Botticelli. And the poets described them, too:

Ful gaye was al the grounde, and queynt
And poudred, as men had it peynt,
With many a fresshe and soundrie floure
That casten up ful good savour.

It was "grass of a deepest green," reports Boccaccio, "starred with a thousand various flowers."

For those who did not care to sit on the grass, seats were provided in the form of fixed turf benches, eighteen inches to two feet high and as much wide, and set against the walls. Sometimes these were supported by planks or brick work. If little flowers cropped up in the turf that filled them, so much the better. In "The Flower and the Leafe" Chaucer describes them:

> And so I followed, til it me brought
> To a right pleasaunt harbour well y wrought
> That benched was and with turfes new
> Fresh turved, whereof the grene gras
> So small, so thick, so short, so fresh of hew
> That most like unto green wool wot I it was.

Often a seat of this kind was built in a circle around the trunk of a tree, the turf being supported by wattles. Such seats, they say, were quite comfortable.

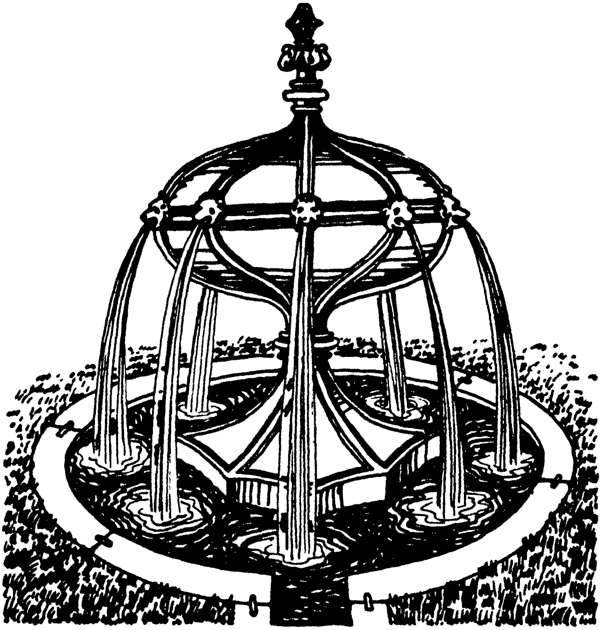
Another feature that grew in both size and design during mediæval times was the arbour or "herbere." Beginning as an extension of the wattled fence that enclosed the early circular gardens and the poles used to shade the turf seats, it developed into a bower of woven wattles over which vines and roses were trained. This gave shelter against the sun and was sufficiently enclosed to make a "privy playing place." And privacy was needed, for where could one find privacy in the great hall of a mediæval castle? Consequently, the arbour figures prominently in mediæval life as a favourite spot for romance and intrigue. It comes into Guillaume de Loris' "Roman de la Rosé" and the "Lays" of Marie de France and Chaucer's "The Parlement of Fowles." A poem written by James I of Scotland while in prison, describes one of these arbours:

> A Garden faire; and in the Corners set
> An Herbere greene, with Wandis long and small
> Railed about.

From the bower or pleached alley the herbere passed to a "covert walk" as Bacon called it, of wood, and so it flourished for the century between 1550 and 1660. Its eventual development was reached in the 16th century when it grew into a green tunnel or gallery that surrounded the garden on three, or all four, sides, and so covered the cross paths that it divided the garden into four parts. This is pictured in the "Hortus Floridus" of Crispin de Pass—pleached galleries supported by sculptured columns with sanded geometrical beds between. Eventually these arbours came to be built of elaborate treillage, often twelve feet high, that formed a house in the middle of the garden, and pavilions at the corners, with windows along the sides. This fashion was begun in France by du Cerceau and in Flanders by Vriedman de Vries. Crispin de Pass popularized it in England into a solid architectural framework. Occasionally we find reference to brick arbours, too, built into the corner of the garden wall like turrets.

The simpler galleries were made of pleached trees—limes especially being used for this purpose—and trained vines. In the end the vines were abandoned when the gallery was transformed into decorative treillage, the form used at Versailles in the time of its glory.

The desire for garden ornamentation led the mediævalist to make knots, a complicated pattern of birds or animals, or geometrical and heraldic figures. This style, originating in Italy, passed to Flanders and France, whence it crossed over to England early in the 16th century. It began as a simple pattern of square beds with a clipped shrub or statue for the central feature. Vriedman de Vries of Holland then started introducing circles, and by the time of Crispin de Pass—1616—they had developed into quite complicated designs. In Tudor England it was customary for the knot to repeat some architectural detail of the house. These knotted parterres grew more and more elaborate up through the 17th century. The beds were usually raised a little above the surface and supported by edgings of brick and tile, or, when level with the paths, marked by low-clipped box, juniper.



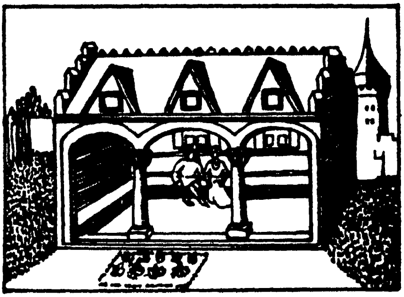
FOUNTAIN FROM THE ROMAN DE LA ROSE OF 1470 yew, rosemary, hyssop, or lavender cotton. Of course in winter the interest of these gardens had to depend on the pattern of the edgings. The French revived the Roman custom of box edgings, and from France it passed to England. Between the green outlines was spread either coloured earths or a planting of acanthus, amaranth, asphodels, cornflowers, cowslips and daffodils, daisies, hollyhocks, iris, lilies, marigolds, mint, pansies, peonies, periwinkle, poppies, primroses, snapdragons, stocks, sweet marjoram, sweet William, wallflowers and violets. And very gallant these gardens must have been—

> Rampande lyons, strode by wonderfly,
> Made all of herbes, with dulset swetnes,
> With many dragons, of marveylous likeness,
> Of diuers floures, made ful craftely

From these knots eventually grew the embroidered parterres of Mollet and Boyceau in the 17th century, which, of course, were a much more sophisticated scheme of garden ornamentation. Finding the loose growth of flowers apt to spoil their designs, these French landscapists abandoned the use of them.

Still other mediæval garden devices were the maze and the labyrinth. The maze was a low planting, the labyrinth a high planting, "well framed to a man's height." These amusing ingenuities traced their lineage back to pagan times—to the mysteries of Isis and the Eleusinian mysteries. From this source the Christian Church borrowed the design and made it into a penitential labyrinth with which to decorate the floors of basilicas, and around which the devout crept to say their prayers, much as penitents and pious folk today do the Stations of the Cross around a church. Occasionally mazes are found even in private houses. In one of the rooms she designed for her palace at Mantua, Isabella D'Este covered the ceiling with a labyrinth. It was probably pious practice that carried this design over from the church floor to the garden floor. Whatever the cause of the transition, both mazes and labyrinths figured in both the Continental and English garden designs of the times, and books of the period suggest many patterns.

Two other heritages the mediæval garden carried on from the Romans—the mount, and topiary work. In the beginning of the 16th century, topiary work appeared in the knot gardens, and from then on for a century it was more and more commonly used and elaborated. At first the surrounding hedges of the pleasance were clipped to square corners. From this easy vegetable sculpture it passed to elaborate forms that lent diversity of interest to gardens that otherwise would have lacked it, because of the limited variety of plants then available. Fruit trees especially were shaped to decorative figures. In gardens outside of Dresden today can still be seen examples of these shaped fruit trees.


A LOGGIA SUMMER-HOUSE FROM A 15TH CENTURY GARDEN

An amusing artificiality grew from this clipping of trees—from this and from the legends handed down by returning Crusaders of the fabulous silver, gold and jewelled trees of Oriental palaces: May trees, around which the people danced, were fashioned of iron in imitation of the way natural trees were clipped. They figure in several mediæval manuscripts.

The mount was a late Roman device, consisting of a heap of earth in the middle of the garden on which was often placed a summer-house that commanded a panorama of the entire garden. These may have first begun as watchmen's towers. The paths approaching them, the planting on the slopes and the pavilion at the top were all subject to elaboration. Some had "stares of precious workmanship"; that "writen about with degrees, like the turnings in cokil shelles, to come to the top without payne"; some were heaped with rocks into miniature peaks; some overtopped the garden by thirty feet. The pavilion was often painted in gaudy colours. When the mount was located in a park, it was used for a hunting covert.

MEDIÆVAL GARDENS OFTEN TOOK THIS CIRCULAR FORM

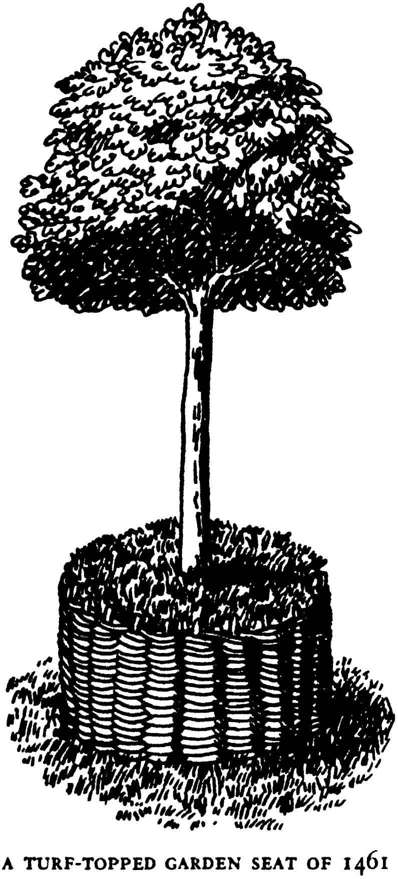
Another form of the mount was a bank of earth, heaped along the outside wall, that served as platform for the guard and a pleasant path from which to observe the garden inside and the fields without.

In various mediæval paintings and illuminated manuscripts we find also such pleasant garden amenities as flowers growing in pots set along the tops of walls—in earthenware pots or jardinieres of tin painted blue and white—strawberry jars planted with herbs, and bird-cages hung in the trees. On large places the aviary was made a feature. At Kenilworth in Warwickshire, a well-known Elizabethan garden, the aviary was thirty feet long, fourteen broad and twenty high. Once in a while there is a peacock, which must have been a great luxury. "Bestes" or carved and gilded animals on poles were included in the garden decorations of one of the royal English domains. Henry VIII had one hundred forty of them in his gardens at Hampton Court and Queen Elizabeth in her day at Whitehall used thirty-four to decorate the planting. The mediævalist also had a quaint custom of building himself a platform up in the branches of a tree, much as the Persians did in their gardens, and here he would retreat for meditation, peace, or whatever other diversion this elevated aerie might enhance.

These later mediæval gardens also lacked no opportunities for games and sports. The bowling green and the archery butt were common features in 15th century gardens, especially in England. And while the men played at games, the women wove garlands. May was their especially favourite time for making and wearing them. When the Menagier de Paris wrote the instruction for his young wife he gave his most generous and husbandly consent to her gardening. "Know that it doth not displease," he stated, "but rather pleases me that you should have roses to grow and violets to care for, and that you should make chaplets and dance and sing."

Garden Management and Tools

How was the work on these later mediæval gardens managed? In England there was generally a head gardener who hired labour from outside, as permanent staffs were rarely kept. The superintendent considered himself well paid at the equivalent of $60 a year, and the labourers received from four to twelve cents a day. Women were employed for weeding and watering and for them a day's wage ranged from four to six cents. We no longer find the clipper of topiary work holding the exalted position as an artist that he enjoyed in Roman times, but we do encounter one specialist—the pleacher, who wove the "wandis long and small" into fences and arbours and pleached the trees and vines that covered them.



A TURF-TOPPED GARDEN SEAT OF 1461

To supply the demand for vegetables in cities and plant material for gardens, there gradually grew up the trade of truck gardener and nurseryman who cultivated extensive nurseries. In Rome the gardeners were formed into a guild as early as 1030. The Company of Gardeners of London, however, was not chartered until the reign of James I. They had their fruit, flower and herb market, however, in the 14th century. It was located near St. Paul's churchyard.

From the pictured manuscripts that have come down to us we find little change in the ordinary garden tools used, although, as grafting was developed into a fine art in the Middle Ages, many knives and implements were developed especially for this practice. The watering of the garden was quite crude at first, the bathing pool or fountain basin served for a dipping well. In some gardens an extra cistern was provided, or a tub kept in a corner and wheeled out, from which water was pumped by hand and sprayed over the plants. Often little rivulets were led along dirt canals around the beds.

City Parks

In this mediæval era was evident a form of civic consciousness destined to leave its mark of beauty on many a town and city and to set an example to future generations. Both Greece and Rome had satisfied the need for city parks. By the 13th century the crowded cities fairly cried for breathing spaces. Slum areas that had become obsolescent were torn down and the space planted to trees and turf, affording a shady place for the citizens to gather. Tuscan towns laid out tree-lined promenades, and many a town in Spain also took pride in its first *alameda.* Other cities developed parks, not unlike the New England common in the heart of the town, with stretches of grass beneath the trees and sometimes an artificial lake. Paris had its public park in St. Germain des Prés, called the Pré aux Clercs. This *pratum commune* has left its name in many Continental cities—the Via del Prato in Florence, the Prado in Madrid, the Prater in Vienna.

Thus came about another step in the evolution of the public park, an evolution that began with Persian gardens into which the public was admitted and that reaches up to the extensive cross-country parkway systems—the elongated park—which the automobile has brought about in America.

CHAPTER VII

A CYCLE OF GARDENING IN CATHAY

IN that long stretch of a thousand years between 500 and 1500 A. D., what was developing elsewhere in the garden world?

The civilization of ancient Persia dwindled before successive conquerors, who laid over it many and divergent influences, beginning with the faith of Mohammed. These Mohammedan lords of Persia pushed eastward to engulf northern India, and establish the long, bloody and fruitful reigns of the six great Mogul emperors and control that vast area as far east as the Indus River. While Europe was groping through darkness to light, China enjoyed the golden era of her cultural dynasties. Meantime also, the Arabs, thrusting westward, swept along the coast of Africa until Mohammedan faith and practice were firmly entrenched in Spain. Each of these migrations and civilizations was paralleled by its particular garden development.

Persian and Arabian Gardening

Just as the gardens of mediæval Europe and England were Christian gardens, so those that extended to India in the east and along the south Mediterranean coast to Spain in the west were not alone made by followers of the Prophet but also bore the imprint of the symbols of the religion he established.

Mohammed began his teachings in 610. Scarcely had the quarter of a century passed than they were spread over a vast eastern territory. Before this the Persians, followers of Zoroaster, had just overrun Syria and were well on their way to conquering Egypt. In 634, two years after the death of Mohammed, his followers, the Arabs, swept Syria into their control. Seven years later they took the great Byzantine naval base of Egypt and, by the turn of the century, established a foothold in Spain.

The Arab was quick to absorb the culture of the people he conquered and to develop the arts and sciences he found. The 8th century saw the dawn of a golden era of learning in Arabia, under the Caliph Haroun-al-Raschid. A century later, Cordova, in Spain, was the western centre of Arabian learning, science and art.

The Arabian form of government provided each district with its own independent ruler or caliph, who developed his own capital. Bagdad, Damascus, Shiraz and Ispahan soon began rivaling each other for beauty. Their gardens were frankly based on the old Persian ideal—formal in shape and planting, with fountains and pavilions and an abundance of shade trees and of fragrant flowers. Both in Persia and Arabia the appreciation of shade extended also to the public ways. Street and roadside planting of trees appears to have been first developed by these Saracenic garden rulers.

The Persian garden was the product of three great influences—climate, religion and a love for green beauty that dwelt in the hearts of the people. The nature of the gardens they made and the garden quality that is found in Persian art can be attributed to this inherent national trait and to the character of their country.

Wind-swept and often barren, the high table-land of Persia enjoys only a few short weeks of spring. The Persian New Year's Day—Nawruz—fell about March 21st, at the vernal equinox, which coincided with the outburst of flowers and verdure. Before that is bitter cold, and afterward, heat almost unbearable, a season when the poet Sadhi said, "the fierce heat dried up the moisture of the mouth and the scorching wind consumed the marrow of the bones." Little wonder her poets sang so sweetly of spring and of their *gulistans* or rose gardens—Hafiz of his garden in Shiraz and Omar Khayyam of Khorassan. Little wonder, too, that their gardens were so planned that they could be abundantly irrigated and that the air could be cooled by the spray from fountains. This need for irrigation and the provision for the impounding of water in brimming tanks and canals dominated the plan and arrangement of their gardens.

GRAFTING, AN EARLY GARDENING PRACTICE

Religion equally influenced the shape and ornamentation of their gardens. The old faith of Zoroaster spoke of a Heaven that was a garden with paths of burnished gold, pleasure pavilions of diamonds and pearls and filled with fruit and fragrant flowers. Here dwelt those who had dug canals and set up fountains and built aqueducts, who had established roadside inns for weary travellers, who had laid out public parks for the poor and never had impiously hewn down trees and plants.

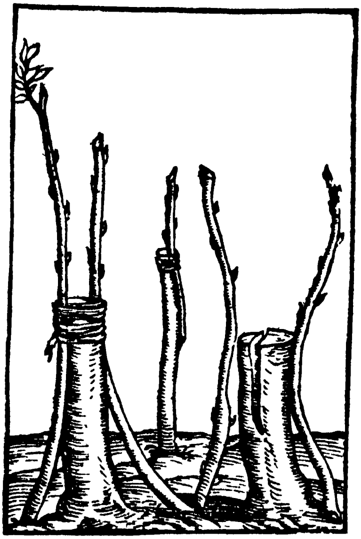
The conquering tribes laid over this faith the religion of Mohammed, whose heaven also was a series of great gardens. Of the seven Paradises, five are gardens: the third, which is the Garden of Rest, is of green chrysolite; the fourth, the Garden of Eternity, is fashioned out of yellow coral; the fifth, the Garden of Delight, is of white silver; the sixth, the Garden of Paradise, of red gold; and the seventh, the Garden of Perpetual Abode, is magnificent with large pearls. Says the Koran: "for him who dreadeth the tribunal of his Lord are prepared two gardens, planted with shade trees. In each of them shall be two fountains flowing. In each shall there be of every fruit two kinds. The elect shall repose on couches, the linings whereof shall be of thick silk interwoven with gold; and the fruit of the two gardens shall be near at hand together. Therein shall receive them beautiful maidens, having complexions like rubies and pearls. Beside these there shall be two other gardens of dark green. In each shall be two fountains pouring forth plenty of water. In each shall be fruits and palm trees and pomegranates. Therein shall be agreeable and beauteous damsels having fine black eyes, who shall be kept in pavilions from the public view. Therein shall they delight themselves lying on green cushions and beautiful carpets." Thus the Persian and Arabian paradise was ever a garden and their garden a paradise.

For privacy, and protection against outsiders and the merciless sands, dust and winds, even the smallest Persian garden was enclosed by a high mud wall. Thickly planted inside, it appeared from without like a bouquet of trees. Within the walls, trees and flowers and a little kiosk made it an oasis of peace and comfort. Usually a rectangle, it was divided into four parts by two intersecting raised paths, and watered by little runnels. The larger gardens followed the same general plan, only the water was more apparent. Sometimes the crossing of the paths was marked by a shallow pool lined with blue tiles or was surmounted by a pavilion over which vines clambered. In the mountainous regions, the garden would be set in front of the hills, the pavilion placed on the highest part and terraces and cascades of water flowing down to a pool at the foot. But water was not always abundant, so the pools were generally shallow and made to appear deeper by the blue tiles.

From the miniatures that have survived we can study many other features of these Persian gardens. Surrounding the house was often a tile-paved terrace with a low decorative fence. The roofs, too, had open railings so that none of the garden enchantment was hidden from those who rested behind them. Sections of the gardens were divided by low fences. When the owner sat in his garden he either spread a carpet on the grass under a flowering tree so that he could enjoy its beauty close at hand, or he retired to a canopied summer-house. Sometimes the woodwork of these garden houses was intricately carved. To give a further sense of privacy, the outer rim of the garden next to the wall was planted with flowering trees and shrubs. In the foreground the beds were planted sparingly to choice flowers.

Of the flowers they cultivated, both the narcissus and the rose were indigenous. The rose was their favourite. Around it grew up a great body of legends. Mohammed thus accounts for its creation: "When I was taken up into Heaven, some of my sweat fell to the earth and from it sprang the rose." The caliph El-Mutavekkel was so infatuated with the beauty of this flower that in the rose-blooming season he wore only rose-coloured clothes and had his carpets sprinkled with rose water. In 210 A. D. the Province of Farsitan was taxed an annual tribute of thirty thousand bottles of rose water that had to be paid into the treasury of Bagdad.

Next to the rose came the myrtle. The old legend tells its origin: "Adam," said the Prophet, "fell from Paradise with three plants: the myrtle, which is the chief of sweet-scented flowers in the world; an ear of wheat, which is the chief of all kinds of food in the world; and pressed dates, which are the chief of the fruits of this world." Of the other flowers, many that we grow in our gardens were common there—chrysanthemums, wallflowers, pansies, lilies, violets, lilac, iris, lotus, poppy, crocus, almond, anemone, jasmine, sweet basil and wild thyme. Grape-vines, melons and gourds provided shade as well as fruit. And the shade trees were cypresses, plane, willow, poplar, ash, beech, elm, juniper, maple, walnut and oak. For fruit they raised apples, pears, peaches (brought in from China in an earlier age), apricots, bananas, dates, figs, olives, plums, cherries, nectarines, pomegranates, mulberries and quinces. Of these the date palm was the first favourite. They believed that God gave this tree as a particular favour to the Mohammedans, and accordingly they considered it their pious duty to conquer all lands where these trees were found.



SIDE GRAFTING AS EMPLOYED IN EARLY ITALIAN GARDENS

There has come down to us the fragment of an old book on horticulture and it shows the Persian gardener curious about many strange gardening tricks. The north and east sides of the house were the best aspects for a garden, this author claims. He has much to say about grafting—the Arabs and Persians had a passion for grafting—and the effect of soils on trees and their fertilizing, and the cure of their diseases. He also has implicit faith in the methods he proposes whereby scentless flowers may be made fragrant, and the dull to change their colours, and bushy plants to become climbers and creepers! His advice is often not more fantastic than that which Renaissance garden authors of Europe set forth as gospel truth.

Since the Koran forbade the delineation of human beings or animals, Persian artists confined their designs to floral and geometrical motifs, still to be found in the carvings, rugs and tiles of that region. Indeed, it is from these ancient rugs that we learn most of their garden design. They are really garden pictures, and show the paths, the pools, the garden plots thick with flowers, the abundant shade and fruit trees. Some display vases and arbours. No statuary is found in these gardens, though one device was remarked, a device we meet elsewhere sometimes; where vegetation was impossible, the beds were made into a decorative pattern with coloured earths or stones. This custom, as we have seen in the previous chapter, was followed in Middle Age gardens.

For over six hundred years the caliphs ruled the land. Then, in the 13th century, Mughals from Central Asià appeared on the frontier. The capture of Bagdad ended the caliphate in the east. The Mughals embraced much of the religion they found and fell into the native ways of living. From the high lands between China and Siberia, Genghis Khan led his horde of 600,000 Tartars. By the middle of the 13th century he was controlling a great area. On his death in 1227 his empire, divided among his sons, fell to pieces, and so remained until it was re-consolidated by Tamerlane (1369–1405).

One after the other, each of these conquering hordes, while bringing in the crude art and taste of their native lands, succumbed to Persian and Arabic culture. The Persians, though enslaved, never permitted their national architectural and gardening traits to become completely obliterated. From them was evolved Saracenic architecture, and on them was based the type of garden for which the Saracen grew famous wherever he carried it. Horrible and destructive as these invasions and conquests were, they brought many benefits to Persia, not the least of which were years of peace and, with peace, the beginning of her greatest gardening era.

Old Indian Gardens

As we saw in Chapter III, India accepted Buddhism three centuries before Christ, and naturalistic temple gardens made by Buddhistic devotees flourished, and set the style for private gardens. Into this primitive Eden swept Persian, Afghan and Turc conquerors from the mountainous countries to the westward. Constantly, from the 7th to the 13th century Mohammedans were thrusting eastward into northern Hindustan. Both Genghis Khan and Tamerlane hammered on the gates of the Pathans at Delhi. Eventually the Mughal pressure won, and under a Mughal emperor Delhi rose to great splendour.

But the people they found there, though fierce warriors, were far from being ignorant of gardens. The small landholder and the rich alike enjoyed their cultivated areas. From the naturalistic temple groves and the worship of Buddha grew a great love for flowers and gardens among all classes of people. Their architecture was picturesque and their gardens shared the same style. Nor were their leaders deficient in public works.

Feroz Shah, who reigned from 1321 to 1388, is said to have made a hundred gardens around Ferozabad, as Delhi was called in that day. While the Persians were planting roadside trees to shade travellers and mark the way across country, he and his successor in India were planting miles of roadside trees and setting out public gardens and orchards. Feroz Shah increased the public works by building colleges, hospitals, caravansaries and palaces, digging canals, erecting mosques, bridging streams and making tanks for public bathing. Some of the canals still remain; the gardens are only a legend.

THE PERSIANS OFTEN BUILT GARDEN BOWERS IN TREES

To those of us who have watched the increase of municipal bathing pools during the past decade, Feroz Shah's hundred-odd tanks come as an arresting fact. The Romans had bathing tanks, but they were rather a luxury for the rich than an accommodation for all classes. To the Indian a bathing pool is necessary to life, so unrelenting is the heat. In our more tempered climates a public pool is a place for sport. How interesting it is to trace the modern public bathing pool, now considered an essential in any forward-looking community, back to the great tanks or *huazs* that Feroz Shah set up for his people in the 14th century.

Over this foundation of private and public garden culture the conquerors of India laid the Persian garden taste and civic amenities they had assimilated through centuries of their occupation of that country. Thus, for India, Persia served the same purpose that Italy served for northern Europe in the late Middle Ages and Renaissance—with the invading armies flowed in arts and science.

The conquerors and their successors, who comprise the six great Mughal emperors, were Babar, 1483–1530, Humayan, 1530–1550, Akbar, 1556–1605, Jahangir, 1605–1628, Shah Johan, 1628–1658 and Aurangzib, 1659–1707. The Portuguese conquered Malacca in 1511 and scarcely had the 18th century turned when the English came.

The first to introduce the Central Asian irrigated garden into India was Mohammed Babar. A fierce warrior and a highly cultured and energetic man, as his memoirs show him to have been, Babar made Agra his capital in 1526 and built the Ram Bagh, which still exists. This word *bagh* he brought with him from Persia. There a man never spoke of his house alone or his garden alone—it was a *bagh,* a house-and-garden. Would that some of our architects had as much imagination and good sense as Babar! The making of magnificent Indian gardens reached its apotheosis in those laid out by Jahangir and his Persian wife, Nur-Jahan, and in the Taj Mahal that his son, Shah Jahan, raised to the memory of his lovely empress, Mumtaz-Mahal, a garden tomb before whose consummate beauty we all stand humble and aghast.

While magnificent gardens are usually the product of a peace-loving, stay-at-home people, the history of India in that arc of years preceding the arrival of the English, was marked by bloody and merciless wars and insurrections. Yet they were also marked by the creation of some of the noblest estates and most beneficial public improvements.

Many new garden ideas did the conquerors of India bring along with them. They introduced straight lines into the naturalistic plantings of the Buddhists, they gave a more architectural character to gardens, and, being of Tartar origin which held to ancestor worship, they laid them out with the idea that, when their time came, they should sleep in their grateful shade. This conception of the garden as a tomb was new to India and many a famous Indian garden was laid out for that purpose.

In the lifetime of the builder it served as a pleasure garden and in its great central pavilion or *barrah,* he held his banquets, received his friends and passed most of his domestic days. On his death, or the death of his wife or other members of his family, the bodies were interred in the pavilion. This was then given over to the care of priests; and gradually, as the family passed away, the entire garden succeeded to their hands and they thenceforth lived on alms and the sale of the garden's produce.

Because of the heat, gardens are necessary to sustain life in India. The average person, the merchant class, say, found his shady retreat in a summer-house made of plaited straw or vines, called a *kas-kanays,* which was placed close to the pool or reservoir so that water could be sprayed on it by servants and the occupants kept cool. The nobility aspired to larger and more elaborate retreats.

When such a person wanted to make a garden, he staked off an area of land outside the village—anywhere from fifty acres up—and enclosed it by a high, battlemented wall. Whereas in smaller gardens one entrance sufficed, in these larger estates the wall was pierced by four tall gates, one to each side, and a feature was made of them. The angles of the walls were marked by small octagonal buildings. A house of any pretensions must have a surrounding flower garden. The main structure was generally located in the centre of the plot where it would be exposed to cooling winds from all sides, and it contained at least four divan apartments. In important gardens this structure took the form of a large pavilion with smaller pavilions adjoining it, the first to serve eventually as the tomb of the owner and his favourite wife, the smaller domes to cover the bodies of his family. The degree to which this central pavilion would be elaborated in architectural beauty is indicated by the Taj Mahal. It was generally located on the highest spot in the garden, and, since this highest spot also held the reservoir, the building often stood on an island in it.

From this central feature the garden was then laid out on the axis of water canals, one extending from each side of the pavilion tank and dividing the garden into four parts. Side canals further divided the area, and, from these, water also was piped underground. The pattern of the garden was dictated by the need for irrigation and for bathing tanks and fountains to cool the air. The water was kept brimming to the top of the canals and generally paths ran each side, raised above the edge of the water. At regular intervals the mirrored surface of these main canals was broken by a jet that tossed its spray into the air. The beauty of the canals was further enhanced by a lining of blue tiles.

To emphasize the general lines of the garden, trees were planted in rows—shade trees along the main canals and in avenues around the outer walls. These made shady walks, which were further embowered by vine-clad pergolas. On a large place the outer part of the garden was developed into a park and under the trees tents were spread. Both around the outer rim and along the main canals fruit trees were often planted, in fact the *bostand* or orchard was an essential part of the Mohammedan garden. "Gardens of palm trees and vineyards and plenteous fruits whereof to eat," the faithful were promised.

The side canals also divided the ground into smaller square plots, some of which were open tables of turf with a tree at each corner, or the trees were grouped to shade a central raised square platform of grass or stone called a *chabutras*. On this carpets were spread, *al fresco* feasts were held, and here the owner received his friends.

Flowers were planted in parterres along the main canals. These flower beds were massed plantings much in the style of the modern perennial border, the plants being grouped according to their varying heights and for their value in colour masses. The flower beds were always sunk below the level of the paths, so that, as one walked along them, the eye fell on the roses and blossoming shrubs planted below. Walking was made easy and the path well defined by stone and marble slabs or brick and tile. This flower garden, considered essential by Hindus, bore the name of *gulistand*.

Water, trees, fruit and perfumed flowers—such were the essentials of the Indian Paradise.

From these ancient flower gardens were taken the designs of the old Paradise carpets or *firdus,* a quaint conceit that was eventually elaborated into a great art. Still other records of these gardens are found in Indian miniatures. In them we can trace many garden refinements.

The pergola was a commonplace feature of these old Indian gardens, as it was in Egypt and Rome; in fact it is a universal item of garden adornment. Summer-houses, called *baradari,* were often built into the corners of the walls. To this day among English gardeners the angle of the wall is a favourite place to erect a garden-house.

Whereas the Persian water canal and conduit was not so wide, the Mughal type, because of the necessity for combating the intense heat, took on more generous proportions. In additions there were large tanks for swimming and long sheets of water deliberately laid down to delight the eye with their reflections of cloud argosies and moving tree tops. Since these canals were not narrow enough to hop across, stepping stones were built where the paths intersected them. We shall encounter these same stepping stones in Japanese gardens.

In contrast to these placid water features were the waterfalls or chutes, called *chadars,* down which water spilled merrily. Sometimes the falls were built up into elaborate stone constructions, sometimes, where the garden was flat, only a foot or so of drop sufficed; but, a short fall or a long one, no garden was considered complete without these rushing waters. It is said that the Mughals, on coming to India, added them to the gardens they found because they were so reminiscent of the rushing mountain streams they had left behind. Gardens are a great consolation to the homesick; many a time do we find little devices such as this transported into a far country by immigrants or conquerors. Just as the flower-loving Englishman today makes a garden in whatever climate he ventures, so did these tribesmen from the tablelands of Persia find surcease from their nostalgia in little waterfalls.

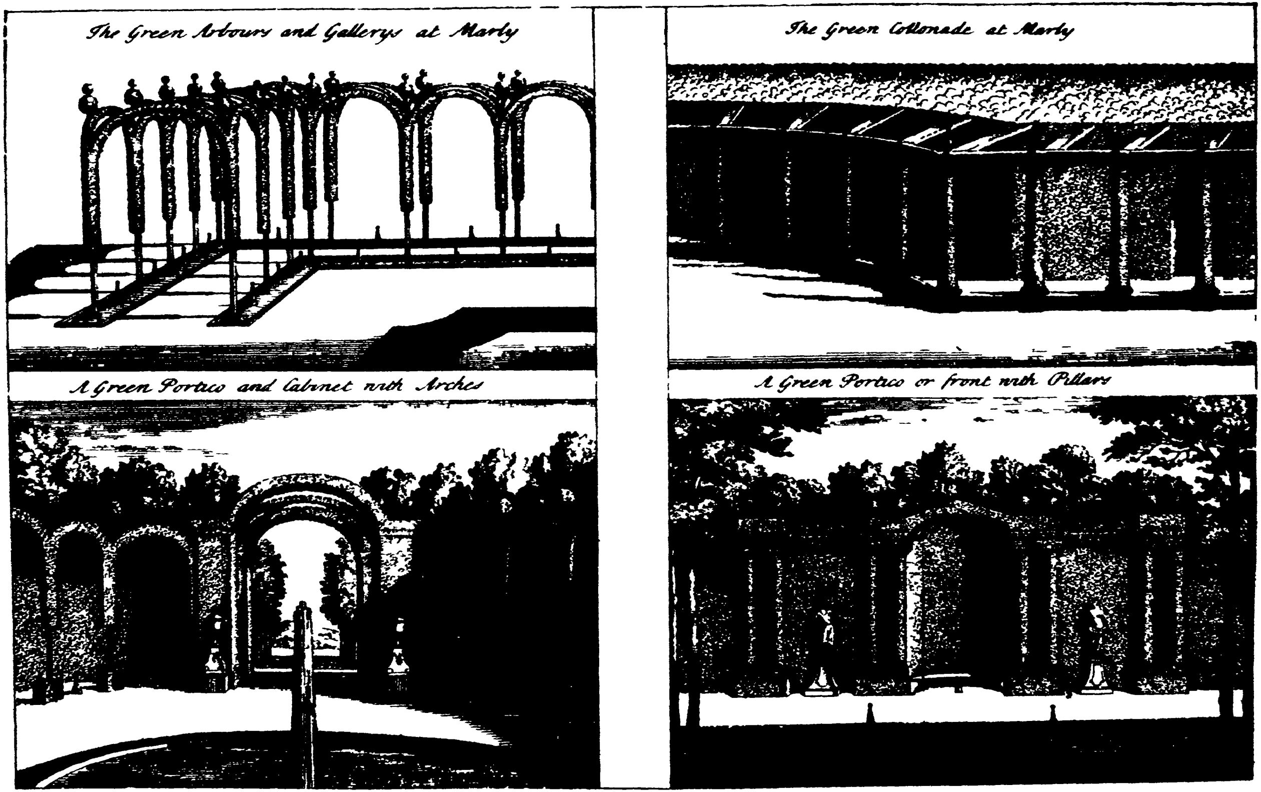
Because life in the garden was very much a part of the life of the people, we soon find refinements of sentiment cropping out. Gardens were made for times of day, and for moods. Some were planted especially to be beautiful in moonlight—with white flowers in abundance and the twinkling of many lanterns—and some for the full glare of the sun. Indians also had a custom of consecrating separate beds or even whole gardens to the development, and then, later, the worship of certain particular flowers. In Samarkand were the Lala-Zar or tulip fields. Near Cabul, Babar, the great Indian warrior, made his favourite violet garden, and at Lahore was laid out the *Gulabi Bagh* or garden given over entirely to roses.

It followed naturally that a people who loved flowers with such devotion should celebrate flower festivals. The festivals are still kept in Kashmir—the day when the Indian lilacs are in their best bloom, with carpets of narcissi and tulips scattered about. The rose had its own day in June, and in July the last of the festivals celebrates the flowering of the lotus. Just so do many gardeners in England and America speak of "Rose Sunday" and "Iris Sunday" and entertain in their gardens on those days. Flowers still play an important part in Hindu religious ceremonials. Temple yards have their flower gardens and each private house cherishes its little bed where flowers for worship are grown, for it is not regarded as acceptable to the gods to bring flowers that are bought, or that lack perfume, or are imperfect.

The Beginnings of Chinese Gardens

In those days India stood as a half-way place on the sea route between Europe and China, just as Persia was on the overland Central Asian trail. Both ways were remote and perilous. Both were ventured very early, but between the ventures came long periods of silence. Yet, watching those roads down the centuries, we catch strange and interesting figures passing along them, figures to play a part in our gardening story.

An embassy sent by Marcus Aurelius, in 166 A. D., returns from China with a gift of Chinese dwarfs for the Roman emperor. There will come a time when figures of gnomes and dwarfs find their way into gardens. Over this trail travelled cinnamon or "Chinese Bark" that the Persians and Arabs sold to the Romans for a medicine. By this way, too, came rhubarb. By both sea and land for many generations unrolled the glamorous ribbon of the



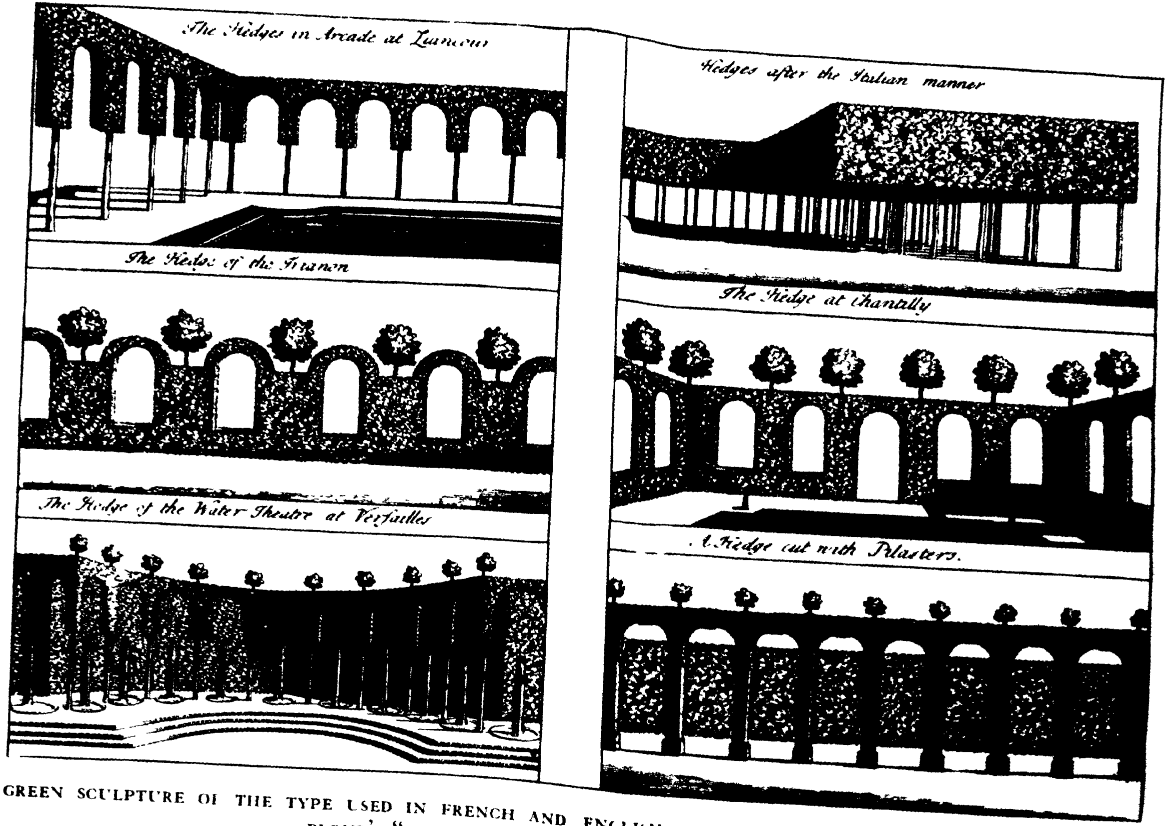
The Green Arbours and Gallerys at Marly

The Green Collonade at Marly

A Green Portico and Cabinet with Arches

A Green Portico or front with Pillars

TOPIARY ART, AS DEPICTED IN "THE THEORY AND PRACTICE OF GARDENING" BY ALEXANDER LE BLOND, TRANSLATED BY JOHN JAMES IN 1728


The Hedges in Arcade at Liancour
Hedges after the Italian manner
The Hedge of the Trianon
The Hedge at Chantilly
The Hedge of the Water Theatre at Versailles
A Hedge cut with Pilasters.

GREEN SCULPTURE OF THE TYPE USED IN FRENCH AND ENGLISH GARDENS OF THE 18TH CENTURY. FROM LE BLOND'S "THE THEORY AND PRACTICE OF GARDENING."

Chinese silk traffic to be gathered into the hands of Persian middlemen and thence dispatched to Rome. Along one of the overland trails in the 6th century travelled two monks, their faces set toward China, to find the source of those lovely silken fabrics. They found it, and toiled the way back again, with mulberry leaves and caterpillars secreted in a hollow staff, so legend says. Thus was the silk industry brought to the west, and the Mediterranean peoples inherited a life-supporting commerce from the dwindling Roman Empire of Justinian.

THE TREE-BOWER WAS ALSO A FAVOURITE RETREAT FOR EUROPEANS

Along just such a trail, from some wilderness valley of outer China, once on a day, was carried to Persia the fruit and seed of the peach-tree. There it was planted, and there Europeans first saw it in bloom and fruit and called it a peach because they found it in Persia. Along the road from Bengal in the 13th century went those who taught the Chinese the art of boiling down sugar cane into sugar. By sea and by land went Marco Polo to the court of Kublai Khan in the late 13th century, to return home with seemingly fabulous stories that most Europeans took for fairy tales.

And through those mountain passes and down by the way of the sea trickled the devout followers of Buddha to push the frontiers of his gospel into the hinterlands of the East. Eventually it was to reach Japan, and eventually in each of these countries was it to affect garden making with its naturalistic temple groves.

But even before the illumination of the Gautama was a gardening and agricultural civilization well under way in China.

The Emperor Hwang-Ti is the legendary founder of Chinese husbandry and medical botany, being successor of the mythical founder of medicine, When-nung (2737–2697 B. C.). He is reputed to have invented the plough, tested soils for the crops that would best grow in them and instituted the ceremonials of sowing various vegetables and grains. He is also said to have written an amazing pharmacopoeia. This formed the basis of the famous Pun-Tsao, the great oriental book of drugs containing some two thousand prescriptions that Li-Shi-Chin compiled from eight hundred writers and which appeared from 1560 to 1590 A. D. The Han Emperor Wu Ti (140–86 B. C.) is also reputed to have made a collection of herbaceous plants and trees gathered together for him by agents dispatched to far parts of the country. To Wu Ti is attributed the introduction into common cultivation of the bean, cucumber, coriander, pomegranate, grape-vine and walnut.

These Han dynasties (206 B. C.–201 A. D.) saw gardens and parks, laid out chiefly for hunting, become so extensive and usurp so much of the land which should have been given to farming that the people revolted. Wu Ti's garden, with its palaces, pavilions and grottos scattered over an area of 50 square miles, was an example of how widespread grew this garden greed.

It is arresting to realize that the so-called Dark Ages in Europe were paralleled in China by the golden age of art and learning—the T'ang dynasty (618–906 A. D.) which saw widespread culture appear, and those that followed it—the Sung, Yuan, and Ming dynasties, the last finally ending in 1644. This Ming dynasty, which began in 1368, brought Chinese garden art to its highest development.

The various religions that penetrated to China and appeared there in these years definitely affected all the arts, the art of gardening among them. Buddhism introduced an appreciation of the natural landscape, and this picturesque style has ever been the dominating influence in Chinese garden design. Other religions only served to accent or refine it. Mohammedanism was established there after the 11th century, infiltrating the faiths of Buddha, Confucius and Lao-tsze.

Confucius preached that it was part of every man's duty to hold public office. Many found this duty disagreeable or boring, and so took to Taoism, which held the contrary opinion. Consequently, the 3rd and 4th centuries saw a widespread reaction against state service and an equally widespread movement among the aristocratic and intelligentsia to make gardens and grow flowers. Thus they brought themselves into harmony with Nature, a state which, they believed, renders man immune from evil.

Moreover, to a man of culture it was considered necessary that he know seven arts—one of which was cultivating flowers. In order to accomplish these arts he needs must possess congenial friends and a country place far removed from the distractions of towns. Now it so happened that many of these retreats were too far off for women to reach and too primitive for them to live in, so it became the custom to make gardens at home for the delight of the women—gardens reminiscent of the far-off retreats. Scarcely a nation but can say that some of its best gardens were made to solace women! . . . We cannot leave so bald a statement without bringing to it the evidence of a tale. None is more fitting than that of the love of the Emperor Genso for the beautiful and extravagant Yokiki of the gazelle eyes—so extravagant that she caused his downfall and brought about her own death at the hands of irate soldiers. Yet her beauty—or perhaps her whims—drove him to carpet the stepping stones of the royal gardens with lotus flowers so that her feet never need touch earth and the balcony over which she leaned to admire the flowers was fashioned out of the rarest fragrant woods. . . . Heigh-ho! What a woman!

In the Tao religion, founded by Lao-tsze, the enjoyment of Paradise includes the companionship of the Eight Immortals, who represent the successful followers of the various trades. Each is designated by his emblem. A basket of flowers symbolizes the gardener, and this symbol is found throughout Chinese art to this day.

Each of the flowers also assumed some mystic importance. The peach blossom became the emblem of spring, the lotus of summer, the chrysanthemum of autumn and the narcissus of winter. The plum blossom symbolized beauty and bamboo stood for long life. The flower of flowers was the lotus. Soon the peony assumed the first place and both in the herbaceous and tree form became King of Flowers. In 1073 one Buddhist monastery could claim to be growing over 30,000 peony plants, and a certain famous private garden of the time grew twice that number—and in many of the lovely forms we know today.

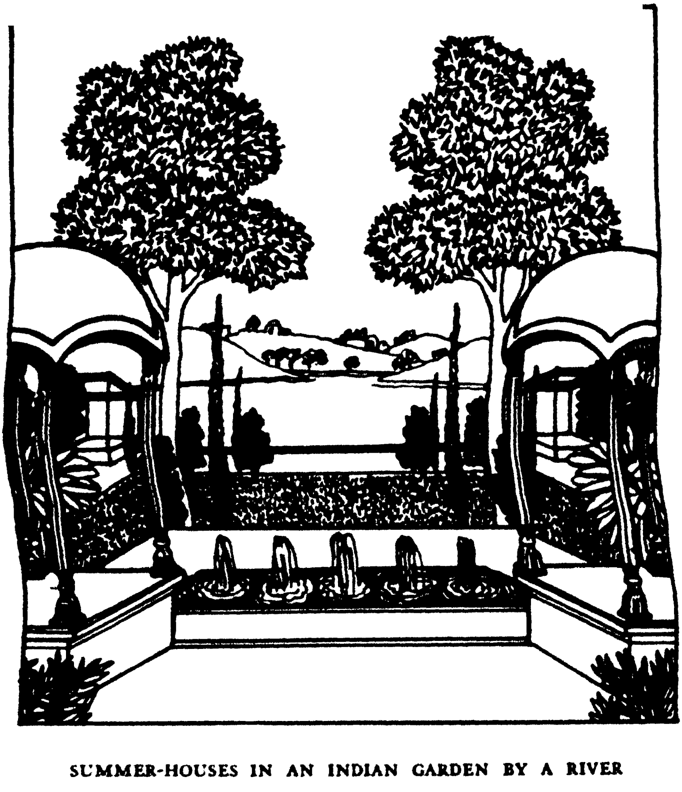
With these went along, in the appreciation of the Chinese, the orchid, cherry, magnolia, mallow, gardenia, and poppy. By the 11th century no less than thirty-nine kinds of tree peonies were known to Chinese gardeners and thirty-five varieties of chrysanthemums. Thus did the consciousness of the beauty of flowers penetrate the soul of these Orientals and become living and enduring symbols to them.

Nor were books lacking on these flowers. In 1688 was published "Mi Fu Hua Ching," a great work on flowering plants, which is still referred to today. Another, which awakened European curiosity was the account of Marco Polo's travels.

Marco Polo's visits to China extended from 1272 to 1293. The tales of the things he found there were given scant credence until the Portuguese arrived in the middle of the 16th century, even though his tales had been substantiated by a missionary, the monk Odoric, who went to China in 1325. In the garden way the most impressive things Marco Polo records of the court of Kublai Khan, was the deer park of the summer residence at Zanadu and the palace of the Great Khan at Kambalu, with its double walls and animal parks, and its convenient raised foot-paths. But most of all was he impressed with the Green Hill, to which he ascribed enormous proportions. This hill had been heaped up from the earth dug to make a lake. The emperor, being interested in trees, collected them from all parts of his domain and fetched them to the flanks of this hill, where he made shady groves with them —the first Chinese arboretum. Then on the top he built a palace. About it were orchards, hunting parks, groves and fish ponds laid out naturalistically.

The Chinese philosophy regarding naturalism was set forth by Lien-Tschen, an ancient writer: "The art of laying gardens consists in an endeavour to combine cheerfulness of aspect, luxuriance of growth, shade, solitude and repose in such a manner that the senses may be deluded by an imitation of rural nature. Diversity, which is the main advantage of natural landscape, must therefore be sought by a judicious choice of soil, an alternation of chains of hills and valleys, gorges, brooks and lakes covered with water plants. Symmetry is wearisome, and ennui and disgust will soon be excited in a garden where every part betrays constraint and artificiality."

Consequently, no Chinese garden was complete without hills and water. The taste for making artificial mounds and setting palaces or pavilions on top of them dates in China from the Han dynasty (206 B. C.–201 A. D.) but, as we have seen before, it was also a custom of the Sumerians who set their temples on artificial holy hills or *ziggurats* and it was likewise the custom of the primitive central American people. How this got from Mesopotamia to China and how from China to lower Mexico, history does not record; but the fact indicates that mountains, like trees, were objects of veneration among primitive peoples. "Herbs and trees, stones and rocks shall all enter into Nirvana," runs the old Buddhist proverb. To the Chinese they became very vivid personalities.



SUMMER-HOUSES IN AN INDIAN GARDEN BY A RIVER

The streams that flowed down their sides were as the veins of the body—indeed, a gentleman was known by the skill with which he made naturalistic water effects in his garden. (Wouldn't it be remarkable if we could judge a gentleman by his garden!) When he made his garden, he fashioned it after the pattern of a mountain range, using the mountain shapes, introducing water and refining the miniature valleys into all the conceivable rock and plant formations found in Nature itself.

The imperial court set the style for gardening and garden layout. Though emperors would have gardens fifty square miles in extent, the ordinary person, no less ambitious, would have a garden of apparently great size on a small area, for the style of garden that eventually became distinctly Chinese was created by scaling down Nature to the limited proportions of one's own acreage. To make a garden, a Chinese gentleman would deliberately imitate some well-known or well-beloved landscape, with every point and item of it pulled down to the scale of his own property. He would transport a stone from this landscape to his own garden, so that it might help him summon up visions of the view he loved. Such flowers as he had were planted, not in beds, but informally, as they grew in Nature. In order that trees might satisfy the small proportions of his landscape, they were deliberately dwarfed, a practice that eventually came to be raised to a high art.

In the course of this miniaturing of the landscape, every item in it took on a meaning, each tree and bush, as we have seen, carried its own symbolism, and so did each rock. The peach tree by the door symbolized immortality, and what house would be without it? Gradually the laying out of gardens became crystallized under fixed laws called *Feng-Shoi.*

The *reductio ad absurdum* of the miniature landscaping is the

Oriental dish garden of *Hacki Niwa* as the Japanese call it, now so popular among the gardening ladies.

Above all, the Chinese garden was a place in which to live, to contemplate Nature and in which the changing moods of the landscape might awaken changing moods in the beholder. This livable quality is expressed in the many pavilions, each located to catch some superb or interesting view, with which Chinese gardens are amply provided. Though the walks were pebbled and the wet spots marked with stepping stones for easy passing, most of the enjoyment of the garden was experienced while sitting down. The great statesman Hsi Ma Kuang in 1026 made a garden of twenty acres in the midst of which he built a library pavilion and filled its shelves with five thousand books. He also piled rocks into a grotto, where he would retreat on hot days. On the shores of his lake was a sanded beach strewn with sea-shells and equipped with another retreat in the form of a fisherman's hut. On the lakes were decorated boats and from the shadowed decks of them the owner contemplated the naturalistic shore line and distant hills he had created.

Thus the court and the imitating aristocracy fashioned their gardens after favourite landscapes. Nor did they object to the common people coming in to enjoy them. There was a marked democracy in these old Chinese gardens. For the common people there were also great public gardens and the gardens around temples. Trees here were inviolate, just as they were in the temple arboretums of Egypt.

Moreover, the common man made his own contribution to the landscape. It was the custom to surround the family graves with trees, and since the graves were inviolate, so were the trees, and eventually the trees grew into groves. Many a grove encountered in the country-side of China today had its beginning in this pious reverence for ancestors and the dead. Alas, the groves around these graves and around temples are often the only green and cool oasis in the tree-stripped landscape of China today.

The time eventually came when missionaries, returning to Europe from China, brought news of these gardens. Europe, bound by the straight lines of formalism, was wearying of them. The naturalism of China gave a fresh and stimulating concept—but that story remains to be told.

Our next step is to follow Buddhist missionaries from the mainland into the islands that now are Japan.

CHAPTER VIII

IN OLD JAPAN

JUST as Christian missionaries conquered Germany and Scandinavia, which Roman legions had failed to do, so the placid devotees of Buddha won the North Pacific islands, that are now Japan, to Chinese culture. And along with this culture came gardens.

Buddhism is believed to have been introduced into Japan via Korea some time after 380 A. D. and to have reached the peak of its influence on all the arts in the Kamakura Period, 1186–1335. During this era appeared the Zen sect of Buddhism, destined to play a great role in Japanese culture. There were gardens before its arrival, of course.

The primitive style consisted of a lake with an island, and from the native word for island the style was called *shima.* When the capital was established in Nara in the 8th century, the emperor Shomu (725–748) began setting the pace for garden making. Here, beside the pond and island, flowers and flowering trees appeared—carnations, cherries, chrysanthemums, oranges, peaches, pines, plums, willows and wistaria. A subsequent emperor, Kwannu, transferred the capital to Kyoto and there made a famous garden, of which remains are still to be found in Omiya Park.

These early gardens are sometimes known as *Shendin-Shiki* or

Imperial Audience Hall Style, for the first of them was made near the reception palace. The building and its wings enclosed three sides of a quadrangle, and in the fourth—and this was always the south side—lay the garden, with its imitation distant prospect. Though the basis of this was a Chinese taste transplanted to Japan, it was a formal, symmetrical style that reflected the architecture of the house and with the house made a complete picture. Its stream, islands, stones and trees were so disposed as to be best enjoyed from the house or the outside.

Effects of Zen Buddhism

With the coming and spread of Zen Buddhism a change began to appear in the arts. The Court took it up, and from the taste of the Court it eventually filtered down to all classes. An East Indian philosophy, it was capable of many and diverse applications. Its followers held to austere living, simplicity, meditation and the attainment of inner illumination through intuitive perception. The first to find solace in its teachings were warriors and such men as had lived amidst the conflicts and complexities of the world. The disillusioned soldier and the sated courtesan alike are sympathetic subjects for austere religions. Ignatius Loyola founds the Jesuits, and the warriors of Nippon retreat from battles and the luxury and licentiousness of palaces to the strict simplicity of Zen Buddhism.

The simplified ideals of this religion soon changed the architecture of palaces and homes from the flamboyant Chinese style to something more plain and direct. With the architecture changed also the gardens. Gradually æsthetic rules for garden designs were evolved. The Chinese philosophy in regard to stones began to make itself felt. This is called *In-Yo,* and classifies all

Nature into the active and passive, the male and the female. By its shape and size a stone acquired its attributed sex, symbol, and moral quality. Besides making gardens according to this philosophy and these æsthetic rules, the priests soon began codifying the principles in books. The priest Zoyen and Fujiwara Nagatsune both wrote books on garden design of which the influence is still recognized.

In the 12th century priests of the Zen sect brought to Japan the finest kinds of Chinese teas and instituted simple tea-tasting groups of warriors and court officials who, assuming the role and wisdom of connoisseurs, would classify these delicate brews according to their flavours and bouquets. Restricted to men at first, the ceremonial has been likened to Freemasonry in that it inculcated its moral principles by means of symbols and through a well-defined and allegoric ritual.

In the eventual course of three centuries tea-tasting grew into the *Cha-no-yu* or Tea Ceremony, a national sacrament devoted to "the admiration of the beautiful in the sordid facts of everyday life." It became an essential factor in splendid feudal old Japan and even today stands as a national symbol that patriotic Japanese evoke to offset the disintegrating influences of Western customs. Around it soon grew up a code of ideals and a ritual that in turn affected both garden design and the enjoyment of gardens. Whereas under the old style, gardens were planned to be enjoyed from the outside, these were made to be enjoyed from within.

The era that saw this Tea Ceremony and its attendant influence arise and spread extends over the centuries from 1350 to 1575 A. D., running parallel with the beginning and the flowering of the Renaissance in Europe. Nor was it restricted to garden-making alone—it also saw the development of flower and landscape painting, *Ikebana* or flower arranging, sand pictures and the *noh* drama. In this arc of years both the art of living and the fine arts were readjusted to that admirable simplicity which became the national trait of the Japanese. Three books of the many published in this time especially interest gardeners—"Sendensyo," a volume on flower arrangement published in 1450, "Kwadan Komoku," published in 1681 and devoted to ornamental plants, and "Kwahu," fourteen years later, which described flowering plants.

The Tea Ceremony

The place for holding the Tea Ceremony was called the *Cha-Seki*. Since it symbolized simplicity and withdrawal from the noisome world, the house was set in a small, secluded spot, hidden away from distractions behind a high fence. Its style was the opposite of the formal garden then in vogue. The winding path that led to it was the highway to illumination. The gradual approach through an outer into an inner garden and even the very structure of the house in which the ceremony was held were all designed to arouse the meditative spirit. So deeply into details did the Zen priests carry the ritual of their ceremony that the style of the garden, the number of stones and plants in it, and even the number of nails in the gates and doors were all specified.

One of the first of the tea priests or *Chajin* to pursue this landscaping art was Muso Kokushi (1275–1351), some of whose gardens may still be seen. Another was So-ami, (1435–1490) at whose suggestion the Shogan Yashimosa built the first tea house in his park. So-ami also wrote a book on hill gardens and elaborated his text with instructive drawings showing the position of the male and female stones. He divided the landscapes and seascapes that could be copied into twelve principal kinds, and classified stones and the necessary trees and accessories into their symbolic categories. It was he also who first clipped and bent trees into fanciful shapes, a custom that is still followed in Japan. The third great master was the priest Korobi Eushin (1579–1647), and the last Sen-no-Rikiu, who laid down garden rules that are still considered law today. Each of these priestly garden artists added his contribution to the ritual of the Tea Ceremony, and his poetic conception of the ideal garden in which to hold it. To Sen-no-Rikiu the perfect tea garden was "the lovely precincts of a secluded mountain shrine, with the red leaves of autumn scattered about." Korobi Eushin said it should convey "the sweet solitude of a landscape in clouded moonlight, with a half gloom between the trees."

To that time the types of garden that were made had fallen into two general groups—those with artificial hills and those on the flat or level. With the rise of the Tea Ceremony, a more pronounced naturalistic style appeared, and this, in its various interpretations, became the national garden style.

While these gardens were designed to copy Nature, the copying was not always direct. Landscape painting greatly influenced it. There arose a type of landscape painting, done in black monochrome, that caught the fancy of the intelligentsia of the day. Many gardens were suggested by these paintings. Later on, in the development of the 18th century English landscape garden, we shall find painting once again affording the inspiration for a garden style.

Since the purpose of these gardens was to reproduce in scale some phase or glimpse of the natural scene and yet to make the garden appear larger than it actually was, they soon developed the art of perspective. This fell into two classes—the Distance-Lowering Style and the Distance-Raising Style. In the gardens he made for the Tea Ceremony, Sen-no-Rikiu, one of the most influential tea priests, used the Distance-Lowering Style—the big trees and ornaments were placed near the house and the smaller in the far distance so that they appeared to recede. Sen-no-Rikiu also introduced *Ikebana* or the philosophic art of flower arrangement, and under his guidance the Tea Ceremony developed its highly symbolized ritual. In the other type of garden—the Distance-Raising Style—of which Furba Oribe was master, the smaller objects were placed in front to increase the perspective height of the tall ones placed in the rear. In both types winding paths added to the mystery of the distant scene.

It is one of the characteristics of Japanese art that the artist seems never to complete his work—the print seems unfinished, the garden lacks some final reality. And therein lay a principle of the Zen Buddhistic belief—each devotee, by his inner illumination, was capable of finishing the picture or the garden himself, according to his own light. A few suggestions sufficed to arouse his intuitive perceptions.

Dry and Water Gardens

The most vivid example of this tenet is to be found in the *Kare-Sansui* or Dried-Up Water Garden Scenery, a type first made by the tea priests in both level and hill gardens. With rocks, pebbles, sand and a few trees or bushes, the dried bed of a stream is simulated. No water is in sight. The logical association of that type of landscape is with water. Water was there once, or eventually it will again flow over those rocks. The imagination provides the water! The same is true of the sand gardens, a favourite device for flat places, consisting merely of a stretch of sand with occasional rocks as though it were a stretch of beach with the tide out. The inner perception of the beholder brings in the tide again!

Contrasted with these dried gardens were the water gardens, in which every conceivable type of moving water found in Nature was simulated, symbolized and given its own poetical name. Where running water is not possible the presence of water is pronounced by making a feature of water basins and wells. No less than ten kinds of cascades are enumerated by Conder in his great work "Japanese Landscape Gardening," each according to the way the water flows from or among the rocks. He also lists nineteen different types of water basins, each taking its picturesque name from the shape of the basin.

By the beginning of the Edo Period, which extended from 1603 to 1867, and was so called because the capital was shifted from Kyoto to Edo, the making of gardens started to pass from the hands of the priests into the hands of laymen. The ritual and symbolism of garden making, as first set forth by these priests, seeped down to the intelligence and acceptance of the average Nipponese, until it assumed the proportions of a national taste. The feudal lords, realizing this public appreciation of beautiful gardens, began laying out public parks. This worthy movement reached its final accomplishment when the public park system was established by proclamation in 1873.

Garden Details

So much for the sketchy outline of Japanese garden history. What were the details in these gardens that made them distinctive? They include the cascades and the various other uses of

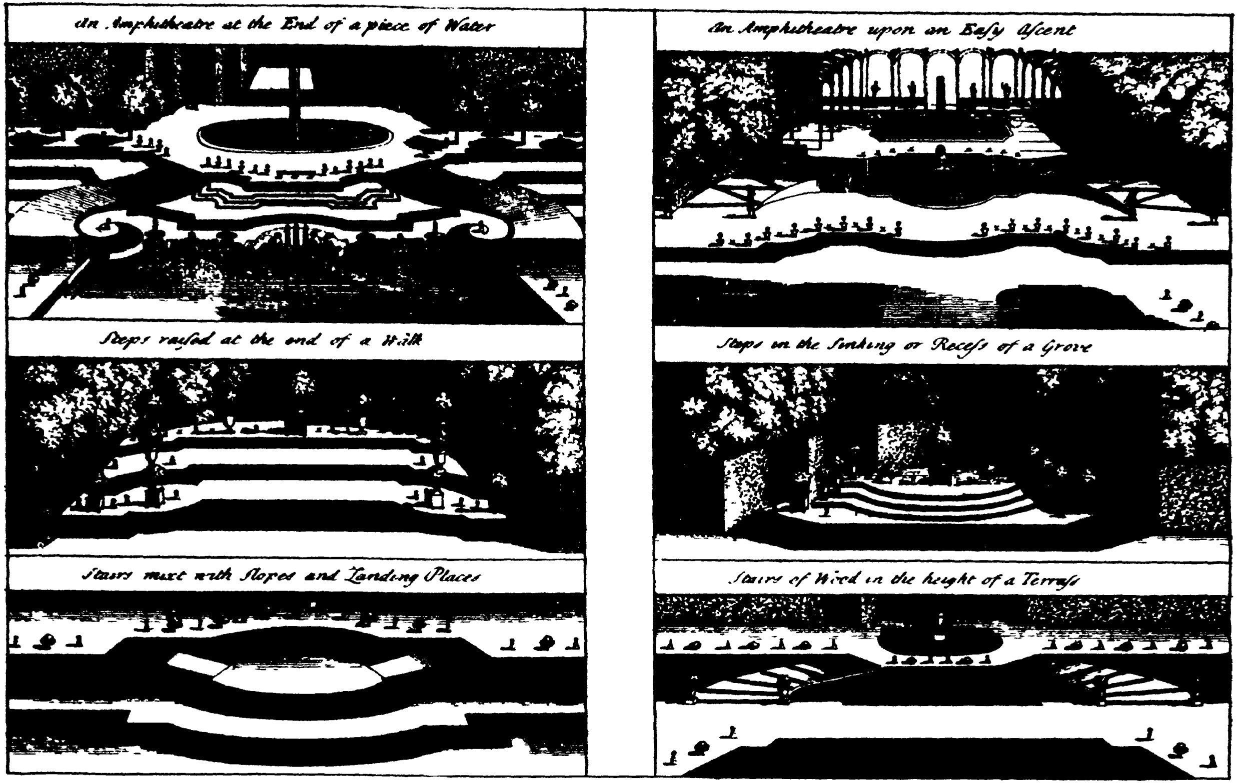
KONRAD GESNER, SWISS, 1516–1565

CAROLUS LINNAEUS, SWEDE, 1707–1778

JOHN GERARD, ENGLISH, 1545–1607

JOHN TRADESCANT, ENGLISH, 1600–1662

FOUR GREAT BOTANISTS



An Amphitheatre at the End of a piece of Water

An Amphitheatre upon an Eaſy Aſcent

Steps raiſed at the end of a Walk

Steps in the Sinking or Receſs of a Grove

Stairs mixt with Slopes and Landing Places

Stairs of Wood in the height of a Terraſs

AMPHITHEATRES AND STEPS, FROM LE BLOND'S "THE THEORY AND PRACTICE OF GARDENING" water mentioned above, the diverse use of stones, lanterns, decorative pagodas, bridges, rest arbours, gateways and fences.

The essential skeleton of the garden was made with stones, each one chosen for its intrinsic beauty, its sex and the moral thought it typified, and according to the size of the garden in which it was to be used. In a large garden no less than one hundred thirty-eight principal stones were required; the irreducible minimum for the smallest garden was five. Conder classifies these five as follows:—

(1) Statue Stone, a tall vertical, resembling the human body and always set upright since it was a male stone.

(2) Low Vertical, which was slightly rounded at the base and came to a cone shape on top. This also was a male stone.

(3) Flat Stone. The horizontal flat character of this type required it to be laid on its side as it represented the passive or female element.

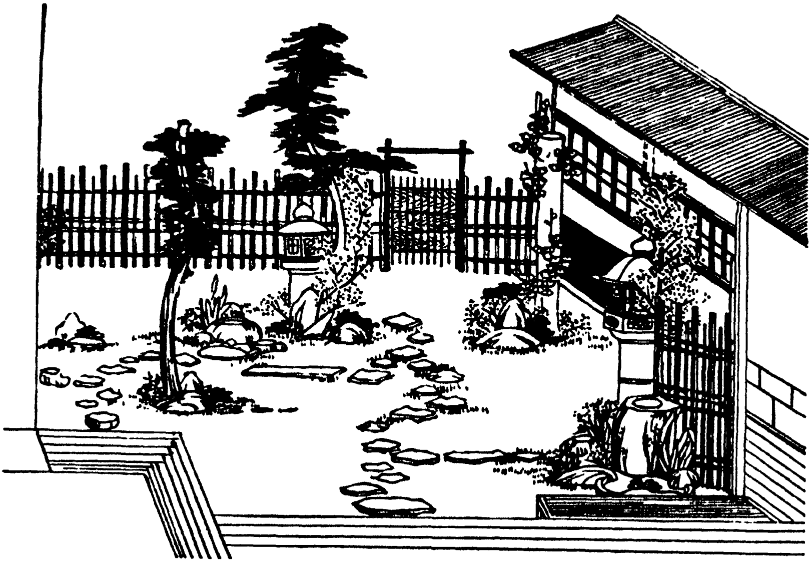
(4) Arching Stone, which is of medium height, has a broad flat top and a veining and shape that bend over to one side. It stood erect.

(5) Recumbent-Ox Stone. This is a horizontal rock with one end higher than the other, and it was laid flat.

These essential stones were grouped in twos, threes or fives, as though placed there by natural forces, the sexes blended and trees, shrubs and grasses filled the spaces between them and gave them a green setting.

In medium-sized gardens stones were placed at the back to add the semblance of height, and others in the foreground and the valleys between. Each had its poetic tag—Mountain Summit Stone, Mountain Base, Mountain Side and Mountain Path. From these four the perceiving mind could furnish the remainder of the picture of the complete mountain. There were also the Mist-

Enveloped Stone, and Clear Moon and the Moon Shadow to suggest other phases of mountain scenery. In the valley or the foreground stood the vertical Guardian Stone, which usually commanded the entrance to the garden, and its accompanying horizontal rock or Waiting Stone. Here and there were Wayside Stones, on which to rest and contemplate the view. The Guardian Stone was essential, so also were the Stone of Worship and the Stone of Two Deities.



AN EARLY JAPANESE GARDEN SCENE, FROM CONDER'S "LANDSCAPE GARDENING IN JAPAN"

According to the type of landscape they helped to symbolize, other stones took on other names, and there were particular stones for lakes and rivers, for cascades, for islands, for valleys, water basins and tea gardens.

Turf and lawns as we know them were rarely used in these gardens. The solid flat areas were either made of pounded clay, which became slippery in wet weather, or were sanded and the sand brushed and raked into fanciful designs. To afford safe passage were laid down stepping stones, some in a zigzag or "Sea Gull Style" and some in "Scattered Islands." Obviously those who walked on these stepping stones were obliged to go slowly, and this necessity for gradual progress was one of the contributions to garden enjoyment that the masters of the Tea Ceremony made. They also insisted on these stones leading to some definite point—to a well, to a glimpse of especial interest, to an embowered stone lantern or to the Cha-no-yu hut itself.

The next most striking feature of Japanese gardens is the stone lantern. First placed in a tea garden to show the way for devout feet, it has now become merely a decorative accessory, since the lantern is rarely lighted. Being a lantern, however, it conveys the idea that light dispels darkness. It has long been a favourite gift to Buddhist temples, where several hundreds of them will be found clustered together. In private gardens and the gardens for the Tea Ceremony they were so located as to best display their beauty—at the base of a hill, beside a lake, or near a well, or on an island. Stones were placed near them and a flowering tree bent behind to give them background.

The earliest material of which these lanterns were made was stone. They were "antiqued" by rubbing loam into the crevices so that moss would soon cover the rock faces. Eventually they were made of other materials—bronze, tile, iron and porcelain. They fall into two kinds—the Standard and the Legged or Snow Scene, the first being a plinth with the lantern atop, the other the low squat type set on arched legs and with a wide roof that holds the snow in winter.

These also acquired poetic associations as the various tea priests designed them. There are eighteen different classifications of the Standard type and three of the Snow Scene. In addition to these, hanging bronze or iron lanterns are used on tea house porches or suspended over a garden water basin.

Of all the garden accessories the lantern was the most purely Japanese in source, since it was never found in Chinese gardens. However, China did furnish a decorative item that is often found —pagodas, which were first introduced into Buddhist temple grounds. They were built in three, five or thirteen stories. Little images of them are constantly used in the dish gardens of Japan today.

One of the oldest elements in the Japanese garden—dating back to the Imperial Audience Hall Style—was the bridge. Through the ages it has been the subject of many elaborations and refinements. Stone, wood or bundles of stick and wattles laid in a wooden frame are the usual materials employed, and they are so built that the person who passes over the bridge will be inclined to stop and glance down. That is why so many of them are arched. That is also why even the crude wooden planks laid through an iris field are set zigzag, so that one will go slowly and enjoy the beauty of the flowers and the scene. This same ideal of contemplation is served by the rest houses and arbours found in gardens of size.

As in our own, the style of fence or enclosure was determined by the type of the garden. It may be a high mud and tile wall, or a bamboo or board fence, each of them capable of elaboration, and each made an ornament to the garden picture. The Tea Ceremony priests are said to have designed twenty-five or thirty different kinds of enclosures. In most gardens bamboo is used, either plaited or placed vertical or horizontal and tied together with wistaria shoots or brown-dyed hemp cords. These close fences usually served for the boundary; inside the garden the fences are more open in construction. The Japanese call the latter *Yotsume-gaki*. They are low arbours of various designs and made usually of bamboo, on which vines are trained. They serve to divide parts of the garden. In the same way hedges are also used.

In addition to these are the "Sleeve Fences"—low screens serving to hide objectional views or make precious some rare glimpse, or to be merely ornamental. Their variety is as diverse as the imagination of the designer, and from their design each derives its picturesque name. Of the twenty-three different kinds that Conder enumerates, let us select three that are suggestive—Leaning Plum Tree Fence, which has a curved top and three circular holes through which can be caught glimpses of the plum-tree planted behind it; Peeping Fence, which is built of reeds about six feet high and is furnished with a slatted opening; and Nightingale Screen Fence, a rustic type found in many Tea Gardens, which is made of irregular twigs left untrimmed at the top and bound to horizontal cross pieces of bamboo.

Each garden has at least two gates—the entrance, which is given prominence, and the service gate or "Sweeping Opening," so called because the leaves are brushed out through it. Through the years an infinite variety of these gates have been developed, some with roofs, like the lych gate of an English churchyard, some merely two posts with a wicket swung between.

Evidently to the ancient Japanese mind these inanimate accessories of the garden were considered first and its planting came afterward. In a sense this is the course followed by the modern landscape architect to whom architecture is the first essential and whose selection of plant material is influenced by it. Four-fifths of the trees and shrubs used in their gardens today by the Japanese must be evergreens, since they afford an all-year-round beauty and attain the ideal, which is to make a green garden, symbolizing long life. Flowering trees and shrubs come next and are intermingled with evergreens. They also have their long categories of symbols. Flower beds such as we enjoy are unknown save close by the ladies' quarters. Flowers are usually grown in pots and set out when in bloom.

It is also interesting to note that very early in their garden evolution the Japanese began shaping and clipping trees, not so much to simulate forms, or the birds and beasts to which the Roman and later the Dutch gardener were given, but to lend the tree an unusual shape needed for a particular position and effect in the garden.

Even earlier began the custom of cultivating dwarf potted trees, or *Hachinoki,* to give the old name; *Bousai,* to give the later. The custom dates back to 1000 A. D. and has continued ever since. For this purpose are chosen azalea, bamboo, cedar, cherry, hiba, ivy, maple, oak, pine, plum and wistaria. Trained for many years into gnarled and twisted forms, they command fabulous prices.

The Garden Not for Export

With the Japanese garden we come, in a sense, to a full stop. Chinese and Hindu cultures have now reached their farthest-east point. Though in time Japan was to contribute generously to the world's store of garden plants, yet in its final state the Japanese garden is a type of imitative landscaping that does not stand travel. An ocean voyage seems to spoil it, as it does some wines. Other gardens migrated from country to country and left their impression on many lands. The Japanese garden has always remained exotic and alien. However carefully it may be laid out and reproduced in a foreign land, it never quite looks at home. Of late, artistic ladies may have succeeded in arousing enthusiasm for Japanese flower arrangements and Japanese dish gardening, but the Japanese garden is so much a part of the national tradition that even the most ambitious members of our garden clubs and the most skilful of Occidental landscape designers fail to transplant it successfully.

The reason for this is the fact that so much of the Japanese garden is wrapped up in symbolism, and without an understanding of the beliefs these symbols portray one misses the whole point in the material fabric of the garden.

Moreover it is well to remember that the making of a good Japanese garden is not a hit-and-miss affair; it follows ancient and strict laws. Every tree, stone and accessory that goes into it has its place, its meaning and its purpose, and these are all determined when the garden is designed.

Equally grounded in symbolism were many of the features of the Saracen garden, as we saw in a previous chapter. Yet we can transplant that garden into foreign countries and appreciate its beauties without too strict a remembrance of its symbols and with scarcely any thought for the religion that gave it character.

We turn our backs on Japan, now, and begin tracing that garden of the Moors on its long migration westward.

CHAPTER IX

MOHAMMEDAN GARDENS GO WESTWARD

THE northern coast of Africa, which lay in the path of the western progress of Arabian culture, had already seen the rise and fall of many gardens. The Egyptians and then the Phoenicians laid out their formal flower plots and orchards. Next came Romans with their courtyard gardens. After the Romans, the Vandals, who apparently destroyed or wrecked the gardens the colonial Romans left. And eventually the Mohammedan horde crept along that coast, both destroying and creating, until it fetched up in Spain.

As they had to India, so to the west they carried their garden culture, their practice of making the house and the garden one, the garden an extension of the rooms of the house—an enclosed court with a fountain, paved paths, and trees and vines to shade them, and a water course to keep the air cool and lend the beauty of reflections.

But even before their arrival, Spain had quickened to the touch of Roman gardening taste, which was laid over the scant civilization of their predecessors there—the Greeks and the Carthaginians. Here in southern Spain, in this most western reach of their great empire, the Romans built aqueducts and prosperous cities, around which they developed their villas and villa gardens. It was an aristocratic settlement. Colonia Patricia, they called

Cordova. Thither they carried intact the country house, such as they erected on the hills around Rome, the *villa urbana,* with its atrium and peristyle garden. Subsequently this was to blossom forth in Spain as the internal courtyard, or patio, with its enclosed shaded arcades, its fountain and its vine-covered trellises that afforded a pleasant and cool retreat from the blistering summer temperature.

When Rome crumbled and the safety secured by the Pax Romana was no more, Christian Visigoths invaded the country. This was in the 5th century. Always at each other's throats, physically and theologically, these newcomers benefited the land very little. Under their neglect of it, much of the culture implanted by Rome disappeared. Their villas have long since gone. Today only a few traces of Rome are left in melancholy ruins of temples, aqueducts and bridges at Alcantara, Merida and Segovia. The Visigoths remained more or less undisturbed for two centuries.

The Coming of the Arabs

Then in sheer desperation (and also to settle an old score with the Visigoth king, so 'tis said) Julian, a Greek Christian officer in the Visigoth Army, invited the Arabs to Spain. A motley crew poured across the straits—Arabs, Berbers, Jews, Goths and the alley-sweepings of Byzantium. At Guadalete in southern Andalusia, Musa, the aged Arabian general, defeated King Roderick and pushed on to take the rest of the region.

These Syrian Arabs, who settled from Toledo south, controlled that great area until the 13th century, and then, beaten back, still clung on to the country around Granada for another two hundred years. Their contributions to architecture and gardening were incalculable. They introduced Byzantine details in the designing of their homes and mosques. It was through them and their descendants, and those of like faith who came after, that Spanish taste was to feel the ennobling pressure of Mohammedan influence for the next eight hundred years.

Their first efforts were directed to fostering agriculture, which necessitated the building of great irrigation systems and reservoirs they called *aljibes.* Having thus assured their food supply, they went about bringing their West Asian culture to the land. This took form in splendid palaces and innumerable villas designed by Persian architects, in the importation of exotic plants and in the establishment of centres of culture. Seville, Cordova and Granada became capitals of the caliphs, and hubs of learning and of the arts, and around them were built the villas and the gardens laid out.

The First Gardens

This Arabian habit of invariably making a garden found an early leader in the first Emir—Abd-ar-Rahman—who conquered Andalusia and took Cordova for his capital in 755. The land subdued, he set about making a garden there, patterned after one his grandfather had in Damascus, where he had lived as a child. His agents penetrated as far eastward as Syria, Turkestan and India, collecting strange plants for this garden. Thus the date palm and the pomegranate came to the Iberian peninsula and, in time, the jasmine and the yellow rose.

Those who followed him pursued the same horticultural interests and with as much intensity. Nor did they hesitate to borrow from the neglected Roman ruins such structural material as they required. The peak of this Arabian garden making was reached with Abd-ar-Rahman III (912–961), under whose influence the country-side became a vast garden. No less than fifty thousand villas surrounded Cordova, the Moslem historian Al-Makkari tells us. They were designed mostly by architects from Constantinople and executed under Byzantine and Egyptian foremen. Ten thousand labourers are said to have worked twenty-five years building the villa of Medina Az-Zahra near Seville, laying up its marble terraces, its mosaic paths, planting its hedges of clipped myrtle, laurel and box, constructing its vine-covered arbours and its pavilions and fountains and irrigation canals. One fountain, fashioned out of green marble, was enriched with twelve animal figures made of red gold and pearls and other precious materials, and from them the water playfully gushed. Here in a pavilion made of translucent stone, silver and gold, and beside a pool of quicksilver, Rahman III held his audiences.

Where are the 50,000 villas? And the magnificent pavilion of Az-Zahra? And the Granada that was "like a goblet full of emeralds?" Their life depended on irrigation. When, under the neglect of others,* that broke down, the gardens died and the tenantless buildings crumbled. Some of the columns of Az-Zahra's house, it is said, were hauled off to be used in building the Alcazar. Well, perhaps many of them had been taken from Roman ruins in the first place. On the site of Rahman's palace was built the farm-house of Arrizapa, and his gardens are now an orange grove. Gipsies now live in caves in the hill-sides that once were gorgeous with villas and gardens.

On just such a flowering hill-side was once enacted as pretty a romance as the heart could desire. Mu'tamid was the last Spanish-born Moorish king to represent Arabian culture. He and his lovely wife Rumaykiyya—a dainty creature with liquid eyes and amber complexion—reigned at Cordova. Both of them were devoted to their gardens and their flowers. One March morning he and she happened to be standing by a palace archway watching snow whiten the distant hill-sides. So rare was snowfall there and so beautiful the sight it made that she burst into tears, begging him either to provide this spectacle each winter or take her where she might see it. He promised her that snow would be there every year afterward to delight her eyes—and he ordered the hill-sides around Cordova to be planted with thousands of almond trees, from which the dun earth was covered each spring with the snowfall of petals.

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* One of the first agricultural projects of the Agrarian Reform in the Spanish Republic was to irrigate 75,000 acres near Seville, the beginning of a large irrigation program to develop estates appropriated by the Republic from the grandees.

Details of the Gardens

Many of the garden characteristics that developed under Persian culture in India were introduced here in Spain. Where a hill-top was available, there was set the villa and its surrounding gardens. It was a high-walled enclosure—the high walls affording both privacy and shade—planted to fruit trees and cypresses and with at least one central water canal. In the canal, jets tossed their needles and from the fountains trickled streams that cooled the air. In fact, water always flows in Mohammedan gardens, for it was thus commanded by the Prophet, who had the good sense to know that flowing water never stagnates.

At the crossing of the paths was erected a kiosk or bower of vines, subsequently to become a feature of Spanish gardens under the name of *Glorietta* or Little Paradise. As in Indian gardens, so here the beds were sunk below the level of the paths, or if the garden was mostly paved, sections were left uncovered to accommodate an occasional tree or bush.

In hill-side gardens, stairs became a feature, and these and the fountains and benches and decorative dadoes were covered with glazed tiles in brilliant colours. Along the walls the tiles were usually run up about seven feet, and above that the wall was kalsomined. These tiles supplied most of the colour, for the Moorish garden was a green garden, shade and coolness being its requisites. Another feature of interest was the decorative paving made with grey, white and bluish-purple river pebbles. It is well to remember, too, now that gardens lighted at night are become the fashion, that the Mohammedans in Spain did precisely the same a thousand years ago. They set twinkling lanterns beside their pools and canals and hung them in the kiosks.

Lawns such as we know them did not figure in the scheme nor flowers as we grow them in beds. If flowers were wanted, they were grown in pots and the pots clustered around the fountain basin or along the canals.

Sometimes the fancy of the owner was expressed in a labyrinth or maze made of clipped box, cypress, juniper, myrtle or holly. One famous example still exists at the Alcazar, but it dates only to the 16th century, in the time of Charles V, for whom it was planted. It was laid out on the same ground as an earlier one, however. Other than these and low clipped box edgings of the beds, the Moors did not go in for topiary work; especially did they avoid the elaborately sculptured sorts for which Rome had been famous. Where there was a particularly fine view, the wall was pierced to frame the vista. Since the Koran forbade them, no statues of the human figure adorned these gardens.

The more utilitarian parts of the estate lay without the enclosure and not too far from it. Water was used economically, especially in Andalusia, being led from tree to tree in terra cotta conduits and the overflow run thence to the *Huerta* or vegetable garden on the other side of the wall.

A Moorish Horticulturist

Today such of these gardens as survive have been replanted several times over and we must turn to contemporary records for hints on the plant material originally used. Enlightening information is contained in a horticultural book, written in the 12th century by Abou Zakaria Iahua Ibn Mohammed—to give only part of his name. This was an extensive compendium on animal husbandry, landscape gardening, field crops, vegetables, flowers, nuts, fruit, in short, about all the information a country gentleman would need on his estate. The landscaping principles he outlined are still followed.

Cypresses, he said, should be used to line the important paths, accent the corners of beds and help frame doorways. In some gardens the same purpose might be served by cedars, jasmines, lemons, oleanders, bitter-orange trees and pines. Deciduous trees should never be mixed with evergreen. Elms, poplars, willows and wild pomegranates should be placed near the water canal and around reservoirs. Over water should be built trellises and arbours, to keep it cool. Pines, of course, should be set where dense shade was required. Since fragrance was most desirable, he suggested growing lavender, balm, mint, sweet marjoram, thyme, acacia, iris, lilies, mallow and roses, the roses to be set between the trees. Grapes and ivy can be trained over trellises to make an awning. For hedges, use box, jasmine and laurel. This worthy Moor also had a good deal to say about tree grafting and the cultivation of plants; indeed, he was highly intelligent about all such affairs.

Almost contemporary was Abd-Allah-Ibn-al-Beilar, the greatest botanist produced by the Arabs in the Middle Ages. He was director of the famous medical school at Cairo, but is better remembered for compiling the Arabic Herbal. As the Moors were deep students of medicine, they soon developed botanic gardens. Under Al Shafrah, the botanist, experimental gardens were laid out at Cadiz. Spain's first botanical garden in the European style was founded in 1555 in a section of the royal gardens at Aranjuez. Four years later the famous private collection of Simon Tovar Cortavilla was established, and by the end of the 17th century Jaime Salvador was assembling a botanical garden at San Juan d'Espe and an herbarium at Barcelona.

Famous Large Gardens

Such in general outline were the gardens of these hill-side villas. The larger places were simply elaborations of the same principles. Thus, instead of one bower or *Glorietta,* a large garden might have eight, to symbolize the eight Pearl Pavilions of Paradise where the houris await the blessed. And if the place was at all sizable, it was broken up into small garden rooms. A small area was evidently considered the ideal garden unit, since within such restricted spaces garden beauty could best be appreciated and enjoyed. The grand vista is absent from these Saracen gardens. At the Generalife the principal court is only one hundred fifty feet long and the Patio of Cypresses, eighty by twenty-eight feet. In the Alhambra the famous Patio of the Lions is only ninety-two feet long and fifty-two feet wide and the Patio of Arraynes seventy-five feet long and only twenty wide.

What is supposed to be the oldest enclosed garden in Europe is the Patio de los Naranjos—the place of absolutions—at the Cordova mosque. It is quite extensive, being an area two hundred by four hundred feet and paved with bands of light and dark river pebbles. At the corners grow palms and, following the lines of the building, orange-trees are set in regular rows. Around each tree is a hollow basin and water trickles from tree to tree through the runnels. This practice we saw followed by the early Egyptians; doubtless the Arabs learned it from them during their long sojourn in that country. The central interest of the patio is the fountain, of course.

Of the many hill-side sites around Granada that the Moors turned into lovely villa gardens, only two remain in any way sufficiently approaching their original form as to interest us in this story—the Alhambra and, across the valley on the slopes of Cerra del Sol, the Generalife.

"Lofty Garden" is the meaning of Generalife, and lofty indeed is its pitch, commanding a great panorama. Built before 1300, it was intended for the summer residence of the Moorish kings of Granada. There are in all seven levels, each with its own character.

From the entrance patio with its lotus fountain, the Court of the Canal is entered through the main building. This court is long and narrow, with building walls on three sides and an arcade down the fourth. A four-foot water channel forms the main axis. It is one of the few of its type surviving in Spain, where doubtless there were hundreds once on a time. Along one side, behind the arcade, is a patterned stretch broken by a little mosque, and one part having a fountain with surrounding box parterres. On the level below this is a small square garden whose walls are pierced by five arched windows to command the view. On the other side of the Canal Court is the Cypress or Harem Patio, with its U-shaped canal, its ancient corner cypresses, and oleanders along the walls and its thickly planted beds. Through an arched gate, steps with pebble mosaic landings lead to another terrace. Above this the ground rises step by step until the Belvedere is reached. Off to one side is a water stairs with concave tiles on the balustrade down which the water rushes. On the other side stairs lead to the Mirador which commands a view of the Alhambra and the distant mountains.

It may appear unseemly to dismiss the Generalife in a few paragraphs, and yet here, as in the Alhambra and other Mohammedan relics, so much has been added and changed since the Spanish kings drove out the owners that very little of the original survives. Nevertheless, the larger part of its existing form is original. After all, Granada existed as a separate state 250 years beyond the crumbling of the Mohammedan Empire in Spain. Through those years and since, brooding over it, has stood the fortress-palace of the Alhambra.

Al-Almar started building this palace in 1248, and, of the magnificence he gave it, four principal courts remain. The most important is the Court of the Pool, now called the Court of the Myrtles because of the hedges of clipped myrtle each side of the broad pool that extends down the centre. Adjacent to it is the Court of the Lions, begun in 1377 by Mohammed V. Slender alabaster columns support the encircling arcades, and there is a pavilion at each end. In the middle stands the lion fountain from which four narrow, straight runnels extend to divide the area into beds. Once these beds were planted to flowers and orange-trees; today they are merely gravelled.

The third court once belonged to the harem and is known as the Court of Doraxa. It is divided formally into unequal box-edged beds and with paths of tamped earth between. A central fountain, half-Moorish and half-Renaissance, is the main feature, although the scattered tall cypresses and orange-trees around the walls compete with it in interest. A later court is the Patio of the Cypresses or Arraques, added in 1654 and content to have a pebbled pavement of an interlacing ribbon design, a fountain set a little off centre and four enormous cypresses.

What a checkered career the Alhambra has had! After they conquered and drove King Boabdil into exile, Ferdinand and Isabella took up their residence there and employed Moorish labourers and artisans to restore the place. Consequently there were other gardens than these four courts that have been described and others will be unearthed as time goes on, for Isabella's grandson, Charles V, tacked many a Renaissance addition on to this Moslem fortress. But the four courts bear the heritage of the Moors in their form at least.

The Alcazar

The Alhambra and the Generalife are not only relatively small compared with the Alcazar at Seville, but they also differ from it in being hill-side gardens, whereas the Alcazar is on the flat. A hundred years after the Christians conquered Seville, Peter the Cruel—the date was about 1350—began building this garden. He employed Moorish workmen who had no hesitation in taking their materials where they found them, and then elaborately inscribed the wall with Saracen characters. Though changed and "improved" by later rulers, the Alcazar, even though only a fraction of what it used to be, gives us a further link in the story of these gardening Moors in Spain.

Here again the gardens have been replanted several times, but the traditional Moorish style has been followed—high clipped hedges edging the raised masonry paths and palms planted formally at the corners of the sunken plots. Where the walks cross, the cypresses have been bent over to make a *Glorietta.* Here are alternate avenues of cypresses and flowering trees, such as would have delighted the heart of Abou Zakaria Iahua Mohammed. In the beginning the garden was quite large, extending down to the banks of the Guadalquivir; now it is broken up and only about sixteen acres remain. Haphazard and irregular, it lacks the ballanced symmetry once found in Moorish gardens. Its glories, however, are its great bathing tank, its parterres with the complicated beds of box, the walks that extend along the tops of its walls and the variety of its tile decorations.

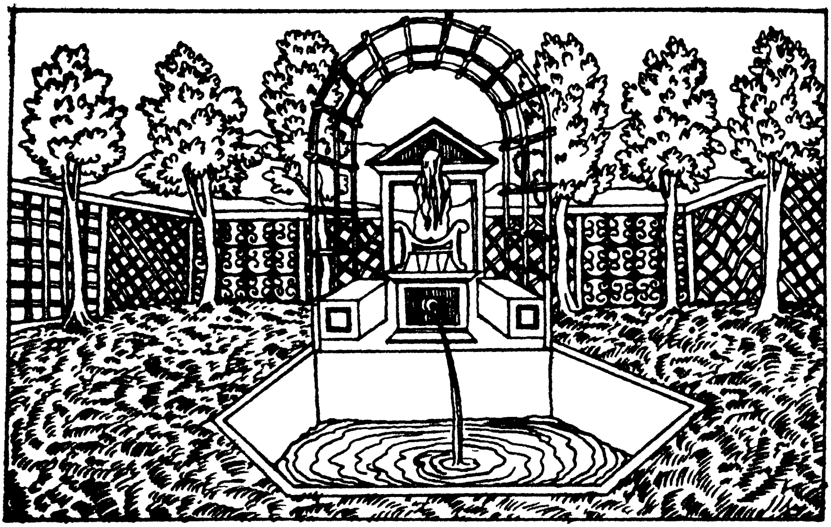
While the great Moorish and Arabian garden influence was growing, expanding and gradually decaying in southern Spain, the northern part was carrying on a different type of garden heritage. From Italy had passed over the monastic orders which built their fortress and cloister garths on craggy mountain tops. In general, they followed the style of monastic houses in Italy, France and England. However, from them came an influence that was to reach and penetrate the new world—the missionary zeal which trailed at the heels of discoverers and conquistadors, and carried with it the taste of the time, just as Buddhist missionaries had carried Chinese culture to Japan.

Already from that new world was beginning to trickle in news of gardens and plants that eventually were to bear fruit in Europe.

Plants and Gardens the Conquistadors Found

On his first voyage to the new world, Columbus encountered many plants strange to him, cotton, tobacco, maize and the pineapple among them. A quarter of a century more, and Cortez was conquering Mexico, with Pizarro shortly thereafter overthrowing the Inca Empire in Peru. In the first country were found agaves, cacao, cotton, capsicum, haricot beans, prickly pear

—of which no less than nine varieties were observed—and tomatoes; in the latter, bananas, cassava, potatoes, maize, tobacco and pineapples. Gonzale de Oviedo (1478–1557) first illustrated maize, pineapples and prickly pears and described rubber in his "Historia General y Natural de las Indies," in 1536. He also mentions guavas, avocado pears, sweet potato and calabash. Another chronicler of these wonders was the Jesuit missionary Joseph de Acosta, who was in Central America from 1570 to 1587 and whose "Natural and Moral History of the Indies," 1558, written in Latin, contained so many interesting items that it was later published in Spanish and translated into Italian, Dutch, French, German and English. The last translation, made by Edward Grimston, appeared in 1604. Acosta notes that the natives of Peru called their nosegays "Suchites" and that so great was the quantity offered them, as Acosta and his band travelled through the back



LATTICED GARDEN OF MEDIÆVAL TIMES

country, that they were embarrassed as to how to carry them. He also relates a quaint legend about how rose pruning began. It deserves to stand beside Charles Lamb's story of roast pig. So rich was the soil and so salubrious the climate, that their roses grew to immense height, yet they bore very few flowers. One day a garden was destroyed by fire and the bushes burned back to the roots. The next year they bore abundantly. Thus the natives learned to prune their roses!

By 1558 Jean Nicot, French ambassador to Portugal, had brought tobacco to Spain. Twenty-six years later Drake was to bring it from Virginia to Raleigh. The rubber that the chroniclers mentioned was merely a curiosity, for not until 1735 did Europe realize its commercial and manufacturing possibilities. By 1553 cochineal-bearing cactus was reported by the missionary Francis Lopes de Gomara (1500–1560) in his "Historia General de las Indies." Its discovery was destined to make revolutionary changes in the dyeing industry.

The potato first is mentioned in the "Cronica de Peru" by Pedro Cieca, published in Seville in 1553. It was found cultivated near Quinto in Peru, whence it was introduced into Mexico after the conquest by a monk, Hieronymus Cardan, and from Mexico to Spain, thence carried to Italy by friars. Drake brought tubers of the potato to Raleigh's estate near Cork about 1655.

Thus the tide of new plants slowly began to trickle in from the west. On the ebb-tide the Spaniards eventually carried to the new world, to establish them there, figs, grapes, apricots, pears, ginger, mulberries, olives, oranges, lemons, sugar-cane, wheat, barley, lettuce, cabbages, onions, parsnips and turnips. In the 16th century they brought the peach to Florida, whence it was spread northward and westward and its cultivation carried on by white settlers and Indians alike. By 1682 William Penn up in Pennsylvania could state that there was not an Indian plantation without peaches.

But even more exciting than these plants was the gardening civilization that the Conquistadors found in the new world. There they encountered races of people passionately devoted to flowers, using a well-established botanical vocabulary, following a careful method of seed selection and making gardens that amazed even the eye of those accustomed to gardens in Europe. "As good as the best in Spain," they said they were.

One of the first official groups encountered by Cortez was a band of native chieftains bearing bouquets of fragrant flowers which they presented, as a welcoming gesture, to the strangers. Another delegation was wreathed in roses. Rulers and men of affairs wouldn't dream of appearing in public without a bouquet or some floral adornment. There seem to have been three kinds: a flat basket of flowers woven into the form of a shield; a long garland worn round the head and neck; and a single choice flower tied to the end of a stick which was carried in the hand. There were also balls of flowers with which dancers pelted each other in their symbolic games.

Mexican civilization was based on agriculture, on the cultivation of the maize especially. It produced a well-inhabited pantheon of horticultural deities. The goddess of red corn was Xilonon, whose festival coincided with the ripening harvest of the grain. For eight days the people danced. Yellow corn supported a male god—Centcetl, worshipped by a special group of priests, old men vowed to silence. Xochizuetzal was goddess of fertility and flowers, and Xochipilli, god of flowers. There were also deities of rain, of growing plants in general and of the soil, to whom flowers were offered and sacrifices made on their feast days. And these festivals were strictly kept. In the fasting month of Tozoztentli, the third month in the calendar, no one was supposed even to sniff the fragrance of flowers!

These flower festivals held an important place in the calendar. At the beginning of the rainy season, farmers and florists cooperated in celebrating the feast of the Earth Mother, their patron. In what is our August was held another festival in which wild flowers, gathered in the fields by the people, were carried to the temple of Huitzilpochtli to adorn it. In October came the Farewell to Flowers, a festival preceded by a four days' fast. The flowers used on these occasions and often those worn daily about the person were chosen and arranged in a manner deeply symbolic. At the Museo Nacional in Mexico City is preserved the statue of Dios de los Flores, the God of Flowers whom the Aztecs worshipped.

The native Indian tongue provided words to classify plants according to their habitat, method of growth, shape, form, fragrance and even their effect when eaten, showing how deeply ingrained in the consciousness of the people was flower lore and how far advanced they were in botanical comprehension.

From the highest to the lowest every one seems to have had a garden, and there were especial words for each kind. The generic term for a garden was *xochitla* or flower place. The humble peasant's patch fenced with reeds was a *xochichinancalli,* the rich man's palace garden was a *xochitecpancalli,* a walled garden was a *xochitepanyo.*

So impressed was Cortez with these gardens that early in his reports to the king—in fact, his second letter to Charles V, written in 1520—he tells of Montezuma's pleasure garden at Iztapalapa, seven miles from Mexico City, one of the three magnificent places the emperor maintained. The palace had "upper and lower rooms and very refreshing gardens, with many trees and sweet-scented flowers, bathing pools of fresh water, well constructed and having steps leading down to the bottom. He also has a large orchard near the house, overlooked by a high terrace reached by many corridors and rooms. Within the orchard is a great square pool of fresh water, very carefully constructed, with sides of handsome masonry, around which runs a walk with a well-laid pavement of tiles so wide that four persons can walk abreast on it, and four hundred paces square, making in all sixteen hundred paces. On the other side of this promenade toward the wall of the garden are hedges of lattice work made of cane, behind which are all sorts of plantations of trees and aromatic herbs. The pool contains many fish and different kinds of water fowl."

Bernal Diaz, who accompanied Cortez, noted in the garden walks bordered by roses and many fruit trees and flowering shrubs. Irrigation canals were wide enough to admit quite large canoes. Here, later chroniclers state, experiments were made in growing various varieties of cypress and decocting medicines from herbs. The vegetables were kept apart, as the king considered it beneath him to grow vegetables and fruit for profit.

Another kingly place was a hanging garden on a craggy hill-top at Chapultepec, where there was a summer residence. The king also maintained various orchard groves and vegetable gardens to supply his table. The most wonderful garden of all, however, was at Hauxtepec, a tropical paradise he had inherited from his predecessor, Montezuma the Elder. Here the rocks were carved into figures of his forebears, not unlike the statues of ancestors that adorned Roman gardens, and there were fountains innumerable and fruit, tree, shrub and flower collections. Among the flowers grown were amaryllis, conculvus, cactus, creepers of all kinds, dahlias and zinnias. Gardeners were constantly being dispatched to other parts of the realm for plants the garden lacked, and they brought home trees and shrubs packed just as we receive them from nurserymen today, with a ball of earth wrapped in woven cloth. The planting of these exotics was preceded by days of fasting; and, before the plants actually were set in the soil, the gardeners pricked their ears and sprinkled the leaves of the plants with their own blood as a sacrifice to the garden god. We moderns do not make the sacrifice, yet, to this day, dried blood is one of the best fertilizers we can find!

Poor Montezuma! His kingdom was wrested from him by one of the cruelest invasions in all history and he himself made a sacrifice to the greed of its conquerors. Even in those last days before his execution, his love of gardens did not fail him. The entire Story of Gardening does not afford a more pathetic picture than this great emperor begging that, before his life be taken, he be allowed to see his flowers once again. Perhaps Cortez made reparation for all his crimes against a great and civilized people when he granted the king this favour.

The example of the emperor was followed by his court and by men of affairs who built magnificent gardens. Around the temples also were gardens. Some had game preserves surrounded by water. Most of the houses were located on high hills, leaving the rich valleys for the cultivation of food crops by peasants. In the towns flowers were grown on the roofs. One famous private garden was at Texcoco, the home of the philosopher, poet-king and maker of laws, Nezahualcoytl (1403–1474). It was a great estate with many kinds of gardens and groves in which the owner worked himself and studied plants. And if there were plants he did not grow, he had paintings of them on his palace walls. To this hill-top garden water was brought by aqueducts, and there were many circular bathing tanks and fountains, one of them chiselled out of a solid block of porphyry.

As the temples required many flowers for services, great beds of them were cultivated around the hill-top terraces on which these temples were located, and some were grown on the roofs. One indication of the high state of agriculture attained by these natives is the fact that the priests, assisted by women, were constantly working on seed selection to improve the crops of maize and other food plants—a parallel to the work carried on in monasteries in Europe.

One distinctive contribution to horticultural technique these native Americans appear to have made in the *Chinampas* or floating gardens, which can still be seen outside Mexico City. This ancient custom consisted in cutting sods to build mud beds in lakes. As the beds were piled up, the sides were supported by reeds and further strengthened by the interlaced roots of willows planted around the edges, the willows being kept pruned low so that they wouldn't overshadow the crops. In these baskets, which extended from twenty to a hundred feet long and from seven to forty wide, vegetable crops were raised. These beds, being situated in water, give the appearance of floating, which, of course, they are not. Actual floating gardens are found on the Dal Lake in Indian Kashmir, where crops are raised on platforms made of interlaced reeds on which soil is piled. When the crops are ready for market, the roots of the reeds are cut and the beds moved to market! Perhaps our closest parallel to the *Chinampas* of old Mexico is the garden made at Dean Hall, near Charleston, where a swamp has been developed into a garden of many irregular beds planted to narcissi, dogwood, azaleas, jasmine, gardenias, and the water to lotus.

What the Conquistadors found in Mexico was almost paralleled by what they discovered in Peru. Pizzaro was received under an arbour of interwoven branches of fragrant flowers and shrubs. The

Inca warriors and nobles adorned themselves with garlands, evergreen leaves being especially worn as a symbol that the virtues of the wearers would endure. The sunflower was worn by the priests and virgins of the Sun. While the palaces lacked the architectural elegance of those in Mexico, flower gardens surrounded them. The favourite residence of the Incas, at Yucay, had spacious gardens and baths. The most wonderful feature of it was a parterre on which flowers were fashioned out of silver and gold, much in the manner in which the Persian kings made their jewelled trees and, in a later era, Louis XIV at Versailles had his terraces in winter time made colourful with plants and flowers fashioned out of ceramics. These gold and silver flowers were also found around some of the temples.

The king took a deep interest in agriculture and each year at a great annual festival he went in the presence of his people to a meadow outside Cuzco where he turned the earth with a golden plough, much as King Tissa of Ceylon, many centuries before, turned the soil for the Mahamigha Garden with a golden colter. This example of the king was calculated to influence the people, for every one, except the privileged orders, was obliged to cultivate the soil. And quite advanced were these farmers. Prescott states that they had their agricultural fairs where farm produce was bartered. To these they brought their cassava, bananas, maize and tobacco—which was ground into medicinal snuff—cocoa, of which the leaf was chewed, and wine fermented from the maize. Here also they displayed for sale their crops of potatoes.

In time the Conquistadors were to transplant some of the architecture and garden forms of their native Spain to these new countries, a subject we will consider in the next chapter. Meanwhile what forms were being evolved back home?

After the Moors

After the Moors were driven out, the source of influence on Spanish taste was Italy, since all countries tapped that source of the Renaissance. By the time it influenced Spain the taste was highly tinctured with the remaining Moorish customs in building and design. This style bears the name of Mudejar. After it came the Plateresque period, when the influence of explorations into far countries began to be felt. Finally arrived the late Renaissance or Baroque.

It was a Baroque taste that missionaries and Conquistadors carried to Central and South America and into our own Southwest and eventually to California. But in these hinterlands the skill of the native artisans, even when trained by the missionaries, was not equal to reproducing all the elaborate Baroque details, with the result that there evolved a simplified Baroque which has withstood the ravages of time and the swirling eddies of taste.

Moreover, these missionaries brought with them the patio of Andalusia. As found today in Spain, patios are of three regional types—those of Seville, of Granada and of Cordova. The first is grand in both proportions and materials—marble pavements and pillars and elaborate tile decorations and iron grilles. The Granadan, with its wooden columns, still carries on the Mudejar style. The Cordovan is simple and substantial—masonry columns, pebble mosaic pavements not too much like tile, and made colourful with blue, yellow and red kalsomine stripes on the walls.

These same whitewashed walls we find in early Mexican and Californian missions. The cloisters are merely elaborated patios surrounded by deep, shadowy arcades, the walls of sunbaked adobe brick, immensely thick. In the centre stands a tiled well, around which flower pots are clustered. Fruit trees and vines complete the homely picture. Its heritage is obviously more of Rome than of Damascus and Bagdad. For when West Asian garden culture reached the Atlantic, its force was fairly well spent—until our own era saw Saracenic gardening revived in French northern Africa, in Florida and California. Behind it was rising the full tide of the Renaissance. Gardens were to be Roman once more.

CHAPTER X

THE GARDEN FLOWERING OF THE RENAISSANCE—AND AFTERWARD

WITH the Renaissance we pick up again the classical garden trail, left several centuries back, when it was emerging from the rutted lane of the Middle Ages. Now it widens again as Italy takes the road once more in the dawning of new light from the East. People advancing on that highway find a fresh interest in Nature and discover their garden ancestors.

By the late 14th century wealth was flowing into the purses of both the local reigning families and middle class merchants. There was less talk about wars and more about politics and business. Feudalism was giving way to trade. Added to these improving circumstances was the increasing safety of the country-side. Consequently life became gay and free.

Many of these newly rich were found in Tuscany, where Florence, their principal city, had become a thriving factory town in the cloth and woollen lines. They had the money to build and the leisure to enjoy their farm houses that lay three or four miles from town. These dwellings were half farm house and half fort. Many fortified farm houses still exist, such as the Villa Capponi at Arcetri near Florence, the Villa Celsa near Siena and Il Trebbio where Cosimo de Medici, first Grand Duke of Tuscany, was born. Not until the beginning of the 16th century did the country house cease being a mediæval fortress and lose its severity for the more livable lines of a *villa urbana.* Such pleasure gardens as these places could boast probably amounted to nothing more than a hedged or balustraded terrace in front of the house—the *xystus* of the old Roman country houses.

The revived interest in country living was accompanied by a marked appreciation of Italy's horticultural past. People took to reading Varro once more, and Columella and Virgil's "Georgics" and the letters of Pliny in which he described his country places. They began dreaming of the life their Roman forebears lived in the *villa urbana* and the *villa rustica,* which once had refined the Italian country-side. It was, in a sense, a nationalistic movement, for the Georgics and much of the poetry of old Rome that extolled Nature had actually extolled Nature-in-Italy. The Renaissance revived this national glorification.

New Books and New Gardens

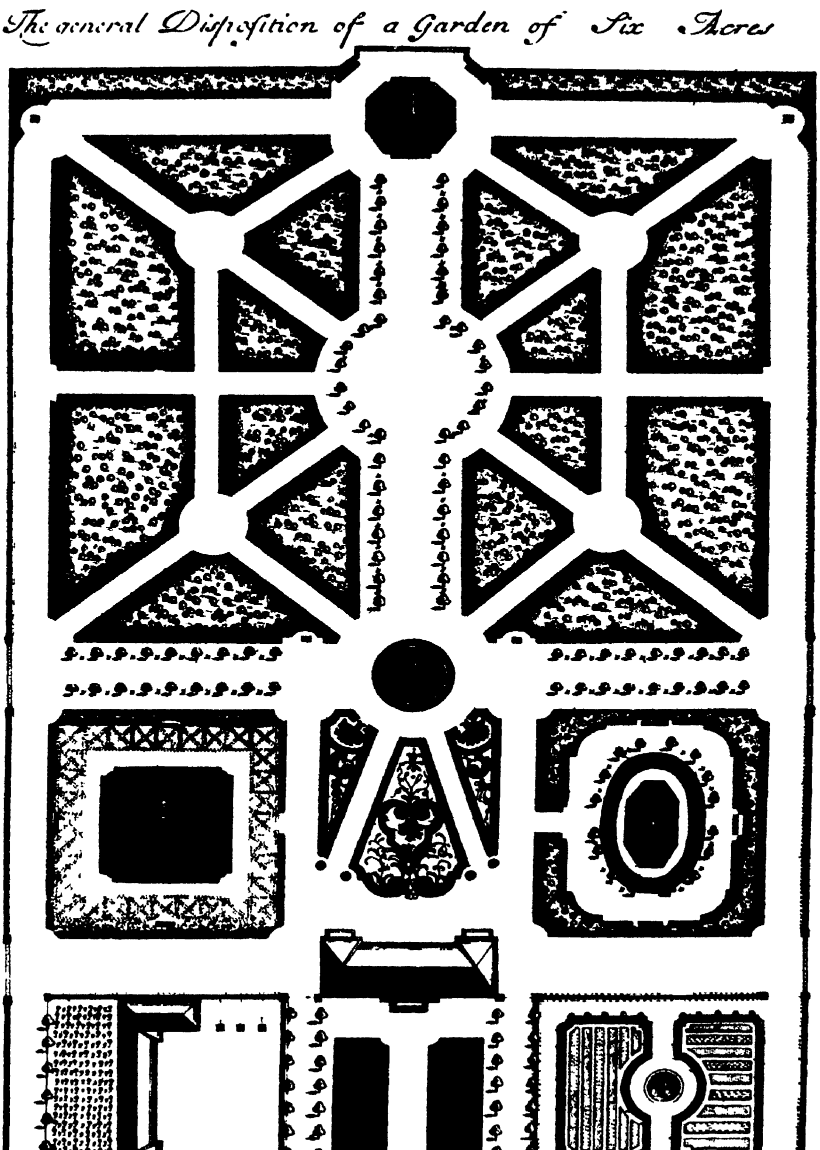
For a long while they had been talking about a treatise on agriculture written by that Bolognan lawyer, Piero Crescenzi, and passed around in manuscript form. "Opus Ruralium Commodorum" was its title. After a century of this vicarious distribution, it was finally printed in 1471 in Latin, and promptly translated into Italian, French and German. Though based on Varro, Cato and Columella, it also contained many of Crescenzi's own observations and suggestions. In the eighth chapter he tells what a pleasure garden should be like, and he has quite decided notions on the way it should fit the size of one's purse and one's station. The humble person should have a small square patch, in its centre an open lawn with possibly a fountain, bordered with sage, basil, mint and marjoram, with grass paths, a pergola for grape-vines and a bank against the wall on which to sit. The middle class might have two to four acres. Nobles and kings, however, should never be satisfied with less than twenty.

The garden of the middle class owner might boast a few beds of fragrant flowers and herbs, an arbour of clipped trees made "like unto a pavilion," lawns, a fountain, a vine-thatched pergola. For protection it should be surrounded by a hedge of thorned shrubs and briars, with pomegranates in warm countries, and quince-trees and hazelnuts in cold, behind the hedge.

The noble place was more elaborate, in keeping with its size and the owner's rank. It should be walled and a ring of trees should shield it from the wind. Beside its flower beds there would be orchards, fish ponds, a menagerie, a summer-house embowered in evergreens, and close by it an aviary thirty feet long in which singing birds would be kept to delight those who lingered near by.

The two little gardens Petrarch mentions in the letter he wrote Vaucluse in 1336 could serve as examples of the middle class type—places of "pleasant green walks with trees shadowing them most sweetly," one a craggy garden for contemplation, the other less severe, devoted to Bacchus. For examples of the princely garden we turn to the poem of the Third Day of the Decameron, wherein Boccaccio describes the garden of Poggio Ghirardo, not unlike a garden of old Rome, and to the fairy palace to which Pampinea brought her companions, and which was the Villa Palmieri, near Florence. These were places with broad avenues, innumerable vine-roofed bowers, meadows starred with "a thousand diversitie of flowers," and carved fountains, all set stiffly in straight lines before the house. Such were the lordly places.

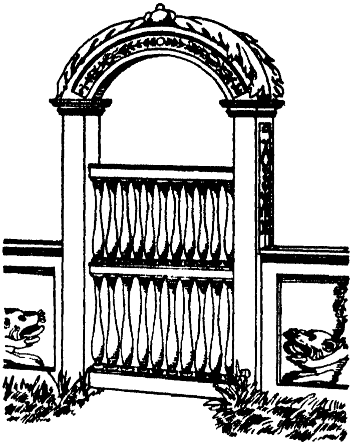
The average Tuscan garden at the dawning of the Renaissance, was little more than a glorified orchard. Peach, pear, plum, quince, apple and orange trees grew between lines of olives. Hedges



PLANS FOR A FORMAL GARDEN OF SIX ACRES, ACCORDING TO LE BLOND'S DESIGNING

ANDRÉ LE NÔTRE, 1613–1700, PRINCE OF ALL GARDEN DESIGNERS, WHOSE MONUMENTS ARE FOUND IN VERSAILLES, MARLY AND MANY ANOTHER GARDEN IN THE GRAND MANNER IN FRANCE AND ON THE CONTINENT walled it in, with rows of aspens ranged beside them and groups of cypresses and stone pines casting long shadows.

After Crescenzi, the contemporary bucolic tendency next found a leading voice in Leon Batista Alberti, the Florentine humanist and architect. In "Del Governo della Famiglia" he set forth the joys of country living, and in "De Architectura," 1434, described his ideal garden. It was a garden calculated to revive the classical spirit of old times and thus parallel the awakened interest in classicism that was appearing in art and literature.


GATE FROM A RENAISSANCE PLEASANCE

Alberti conceived a garden drawn with straight lines within a square that divided and subdivided it. The chief feature of the subdivisions would be a green lawn bordered with box, myrtle or laurel clipped to thick, rectangular masses. Trees would be planted in straight lines, either in single file or rows of threes. At the end of the paths classical summer-houses of intertwined laurel, cedar and juniper would stand. Flat-topped pergolas, supported by stone columns and thatched with vines, shaded the paths. Dotted along them were stone or terra cotta urns. In the flower beds the owner—delightful touch!—would spell his name with box. Hedges would be trimmed at regular intervals into niches to hold statuary and with marble seats beneath. At the crossing of the middle paths stood an oratory of clipped laurel, and near by, a labyrinth, shaded by an arch-topped vine trellis, flanked with damask roses. On the hill-side, where water descended, he would build a grotto of tufa rock, and beyond it place the fish ponds, pastures, orchard and the vegetable garden.

Note that not much stone was used in this garden. Alberti's architectural efforts were confined to arranging and clipping plant material. His was evergreen architecture.

Toward the end of the century Alberti had a chance to carry out some of his ideas. Near Florence he designed a garden for his fellow townsman, Giovanni Rucellai, in which he made a feature of the pergolas, provided a walled garden of potted plants and of herbs, a hedged rose garden and a mount covered with evergreens up which wound spiral paths.

De Medici Villas and Others

The Florentine countryward movement was greatly stimulated when, in 1417, Cosimo de Medici bought an estate at Correggio, twenty-two miles north-west of town, and employed Michelozzo Michelozzi to design the house and grounds. This was a bold venture. He also had Michelozzi design him a villa in the Apennines. This architect attained his masterpiece in the villa he built for Cosimo's younger son, Giovanni, on the hill-side at Fiesole. Successive generations of the de Medicis and their friends added to these estates and increased their villa holdings. The de Medicis eventually built no fewer than eleven villas near Florence.

In 1549 Eleanora de Medici began the Boboli gardens behind the Pitti Palace and employed Buonta Lenti and Il Tribolo to lay out its magnificent amphitheatre in which to give fantastic spectacles, and the Isolotto Island crowned with John of Bologna's statue of Oceanus. Another villa was Castello, where Il Tribolo built the finest grotto in Italy and placed the famous fountain of

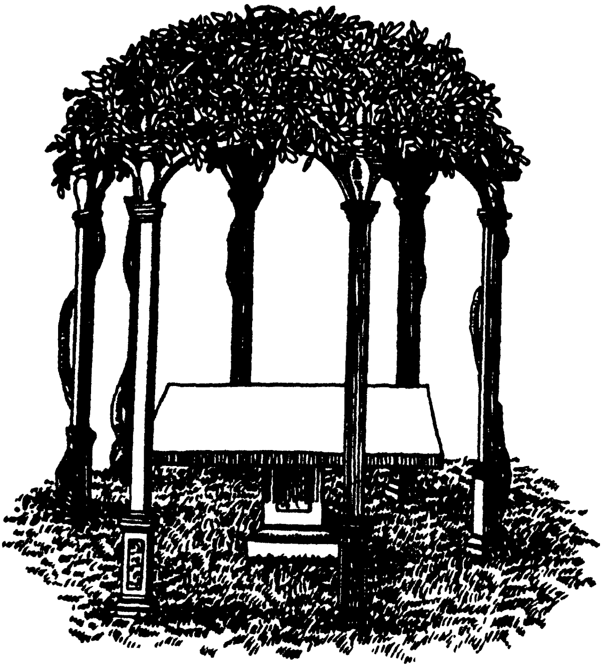
Hercules and, on the upper terrace, set the colossal figure of the Apennines recumbent beneath its sheet of water. The peak of this villa building arrived when Lorenzo de Medici had Giulio de San Gallo design for him, ten miles west of Florence, on the site of an old family fortress, Peggio a Cajano, with its extensive parks and collections of rare birds and animals and groves of mulberry-trees. It was completed about 1485.

The style thus set, villas began springing up on all the hill-sides around Florence. And in them was gradually evolved a manner of garden making that came to be distinctive. Thus, whereas in the earlier rough country places topiary statues of men and animals sufficed to provide the decorative garden figures, the later gardens began to use actual statues dug up from old Roman ruins.

The venturesome soul who first used these battered antiques for decoration doubtless made his friends laugh behind their hands. But they soon enough began copying him, and the statues, too. The soil fairly sprouted statuary. Men of taste pursued archæology as they would the chase. First they placed these antiques in the house; then, as the house filled, they spilled over into the garden. If there was any actual bit of ruin about the place, it was made a feature. These Florentine humanists were no ecstatic respecters of antiquity, however. True, they copied antique art, but often they deliberately destroyed the old to obtain material for their versions of antiques!

Invariably their gardens were laid out with an appreciation of the surrounding country-side. They chose the site for its view and planted their alleys of cypresses and ilex so that they framed the distant prospect and made it a part of the garden picture.

Several other features began to appear. The late 15th century saw water devices imported from Spain. Even more marked was the use of terraces. Up to this time the garden had been laid out on the flat plain that stretched directly in front of the house. This soon became a terrace and the façade of the house facing it was broken by a loggia. The next step was when the garden extended beyond that flat terrace to other terraces below. Flights of stone stairs connected them. This, of course, was the only logical solution for making a garden on a hill-side. By 1550 these terraces had come to be the chief feature of the Italian garden. The increasing of these terraces, each supported with a stone wall and linked with the other by stone stairs, added greatly to the construction work of the garden. Stone began to compete with growing plant material. Architecture threatened to set itself up above horticulture.



A GARDEN ARBOUR DATING FROM 1600

Two other distinctive features these Tuscany villa gardens had —the *giardino segreto* and the *bosco.* The *bosco* was a thickly planted grove into which the family and friends could retreat on hot days and always find cooling shade. The secret garden was a little space close by the house and surrounded by high clipped hedges, a descendant of the original house terrace. Here were box and myrtle-edged beds of flowers surrounding a central fountain. Women of the household grew their flowers and herbs in this secret garden and here they walked on sunny days in winter. Behind those high green walls many a romance began and many a heart was set aflutter.

Despite the appearance of stone terraces, the Tuscan garden maintained its innocent verdure for a long time. Not until it was Romanized did it become a display of architecture. This transformation was brought about through the employment of Florentine and other northern architects in Rome, who, on returning home, practised the same style in Tuscany and other parts of the north.

Rome Begins Garden Making

The garden making urge appeared in Rome in the first years of the 16th century. Reports of the Florentine villa developments, filtering southward, aroused a beneficent ambition. Pope Julius II developed a passion for collecting antique statuary, and Ferdinando de Medici did the same, setting up his finds in his villa on Monte Pincio.

This same pope made a bold stroke by employing an architect from the north to do a garden for him. Lazzari Bramante, who came from Urbino, had gained an established reputation as architect to the Sforza family at Milan. When that family's wealth declined, he went to Rome to study the ruins and antique art that were being discovered there and that every one was talking about. Previous to his arrival a determined effort had been made by the Papal court to redeem Rome from the mass of dilapidated ruins that had characterized it, by enriching it with splendid new buildings. The Vatican palace had been enlarged and at a distance from it had been erected a pleasure palace called the Belvedere. Bramante, having attracted notice by several important commissions he had filled during his stay in Rome, was assigned the task of connecting the Vatican palace and the Belvedere by some sort of garden.

Up to this time a strictly architectural garden treatment was unknown. This style Bramante chose for his problem. Although he never lived to finish it, the work that he did accomplish and the plans he left behind him constituted such a departure that it set all the artistic world agog. It definitely started the style for architectural gardens, and its appearance stimulated garden making in Rome. Thereafter Roman gardens were to have broad stone terraces, and flights of steps connecting them, and summer-houses and elaborate fountains and collections of antique statuary disposed about. Nature henceforth was to be restrained and squeezed into the pre-arranged design of the architect.

The example set by Julius and Bramante was immediately copied by cardinals, papal officials, artists and men of affairs. A healthy rivalry between them caused the seven hills to flower with villas and the surrounding country with new farm houses, both elaborate and small. Country living became the order of the day. One cardinal made an especially fine lawn, another raised a villa on the site of the gardens of Sallust. Cardinal d'Este built his villa at Monte Cavallo and Cardinal Riario at Trastevre. In 1540 the Villa Medici was begun, from designs by Annibale Lippi. Much of the original glory still exists—its parterre shaded by ilex and stone pine. Pope Leo X in his time shared this fashionable taste for gardens. The peak of architectural accomplishments was reached when Giulio de Medici, Leo's nephew and himself later to become Clement VII, chose a site on Monte Mario, for a sublime country house called Villa Madam. Three artists, one of them Raphael, were employed on the plans. They consisted of a series of garden reception rooms and communicating terraces. Only twenty-six, Raphael had already rolled up an enviable reputation for himself by designing many churches and palaces and the lovely country place of Farnesia. Although only a small part of his projected work was executed, enough of it reached completion to show that it was a sublime conception. The noble simplicity of the villa and its gardens, the just balance maintained between the hard lines of architecture and the softness of verdure, set the standard for all such work in subsequent decades. Its ruins are now being restored.

This peak of Rome's garden making was reached in the second half of the 16th century. Another fifty years, and the city was so embroiled in political factions and fights that life there became unsafe. Many of the villas were never finished and quickly fell into ruins. Those owners who could afford it fled the city for the distant country-side. Artists, always ready for commissions, followed them—some to isolated country estates, some to their native cities and towns. When they left the capital, many of the Tuscan noblemen took their collections of antique statuary along with them to Florence.

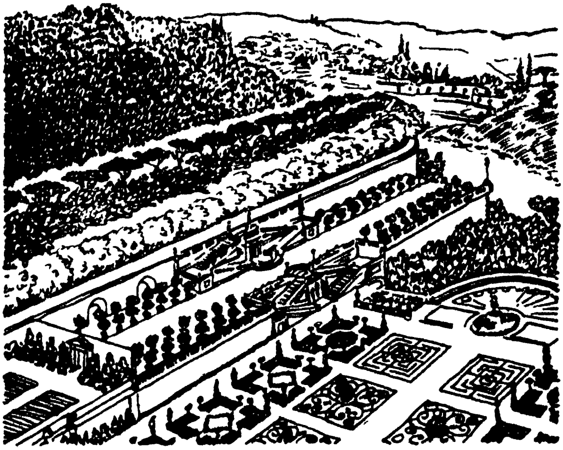
It is well to remember that the Renaissance garden was scarcely a spontaneous national movement. Rather it was "spotty." It rose around the artistic endeavours and cultural ambitions of a few prominent reigning families and their estates, such as the de Medicis in Florence, the D'Estes in Tivoli and Mantua, the Sforzas in Milan.

Despite its internal disturbances, Rome managed to survive as a garden city. On the Janiculum Hill sprang up the Villa Pamphili. Early in the 17th century, Scipio Borghese began laying out the villa that bears his name, and, with the help of the architect Rainaldi and the Flemish Giovanni Vansanzio, made the casino, the fountains, the grotto and the famous garden of herbs.

Thus Rome's late Renaissance repeated the garden success that it had enjoyed under the Caesars. It also experienced the same crowding that had troubled old Rome. When garden space got to a premium, those who aspired to extensive places moved out to Frascati, at the foot of the Alban Hills. The Villa Aldobrandini, begun there by the nephew of Pope Clement VIII at the end of the 16th century, was a direct result of this crowded city condition. And at Frascati he found ample room for the ambitious plans of his associated artists, the architect Giacomo della Porto, the garden architect Giovanni Fontana and the water expert Orazio Olivieri.

Italian Country Seats

The provinces were not far behind Rome in garden ambition. The movement started when Cardinal Alessandro Farnese called in Giacomo Vignola to design his fortress palace at Caprarola, near Viterbo, a superb site commanding an extensive panorama of the Campagna. Its walls were three miles in circumference. Here Vignola laid out the parterre surrounded by Baroque statues and erected the famous grotto. Seventy years later Cardinal Odoardo Farnese further enriched the estate by erecting the villa which is known by his name. Between the 60's and the 70's of the 16th century Cardinal Gambara began the Villa Lante at Bagnaja, which Vignola designed for him. It is a summer place with two balancing structures above an extensive water garden. The aviaries were made a feature. The same architect designed the Villa Capparola and the Villa Papa Giulio at Rome. In Florence the Boboli Gardens surrounding the Pitti Palace attained the height of their glory under Tribolo's supervision. There were even made, in the restricted soil of Venice, lovely little paradises that hung over the canals.



A RECONSTRUCTION OF THE GARDENS AT THE VILLA MADAM

And there was also the villa garden that Cardinal Montalta commissioned Domenico Fontana to design for him. This last garden is singled out because it marked a departure. The approach to that departure was gradual.

Even in the beginning of the Renaissance, plants were subjected to architectural design by being clipped into solid masses and walls. Flowers served only to trace patterns in geometric terrace beds. Plants were thus forced to assume an architectural aspect. Free-flowering trees were scarcely ever seen in the gardens near villas. Only in the distant orchards did they grow as Nature made them.

Once an architectural garden of this kind is made, it has merely to be kept growing in the proper shape. Gardening is reduced to maintenance. Consequently the only spots where one could actually garden were in the *giardino segreto* and the *giardino dei semplice* or herb borders. On the terrace the mathematically correct formal beds were held within low hedges or wooden lattices.

It also followed that, since architectural effects were desired, only those plants which could be trained to meet architectural exactions were used—cypress, pine, ilex, laurel, box, juniper and yew. And that accounts for the limited number of plants one finds in gardens of the Italian Renaissance.

The architect, having imposed his purpose on Nature, next took to stone, and stone balustrades and flights of steps began flinging their arms around gardens.

Even water was made subject to design. At no time was it permitted to flow naturally; it always was restricted within stone channels and forced into fountain jets. As gardens grew more elaborate, the designing of fountains and water stairs was fairly to exhaust the ingenuity of artists. The grotto also displayed a high order of imagination and the mount, which commanded the garden panorama, enjoyed all manner of elaboration.

In the garden Fontana laid out for Cardinal Montalta, the new departure was composed of long avenues of clipped trees with architectural or sculptured endings for focal points. This marked the beginning of the perspective style that Le Nôtre was later to bring to magnificent perfection in France.

This same age also saw the introduction of the theatre into the garden. At the Villa D'Este, at Mondragone in Frascati and at many another elaborate country place, areas were laid out for entertainment on the grand style. Rings of turf benches were made to accommodate an audience, and clipped walls supplied the backdrop and wings of a stage. Here were given fiestas and banquets, tournaments, dances and pastoral plays. In Elizabethan England the garden was a favourite place for masques. By the 18th century the theatre had become one of the most important garden features on large estates. And from this glorious era the mind leaps the centuries to our own—to Ben Greet players nobly mouthing Shakespeare on lovely moonlit lawns and to dramatically aspiring matrons paying their tyro tribute to Thespis, for sweet charity's sake, between the shrubbery of minor suburban estates.

The Baroque Era

The Italian garden passed through three distinct phases. Having begun in the 15th century as a local Tuscan product of Humanistic thought and classical appreciation—such as the early villas of the Medicis—it became Romanized with imposing architecture in the 16th century, as in the various Papal villas and at Florence and Genoa and Caprarola and Bagnaja. In the following century it developed Baroque tendencies, as in the Roman villa park, in the villas Aldobrandini, Borghese, Albani and those at Frascati. Heretofore, gardens were intimate places. In the Baroque Era, they became extensive. Their designers thought in large terms and executed their plans on the grand scale.

This third stage was also to give plants a breathing spell, although by no means were they treated informally. However, the sharp corners of the strictly mathematical gardens were rounded off. Some of the gardens became rustic and romantic. Artificiality cropped up on all sides. Even the most formally terraced gardens began to assume the appearance of magnificent hill-side parks.

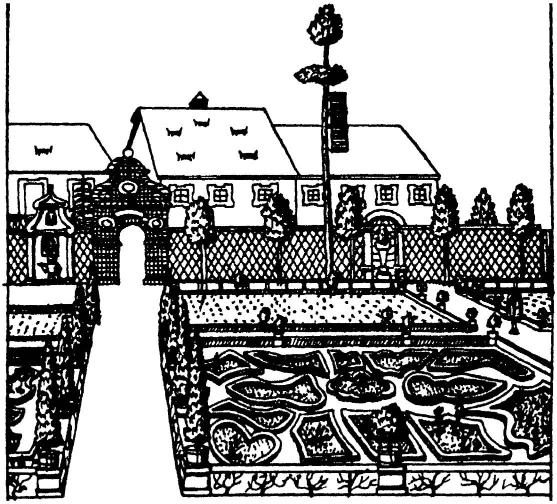
This tendency was first evident in the fortress-like Villa Farnese at Caprarola, forty miles north of Rome, which as we have seen, Vignola designed in the later years of the Renaissance. It came into full flowering with the gardens of the Villa D'Este at Tivoli which Pirro Ligorio Giacomo della Porta and Orazio Oliveri designed for Cardinal Ippoleto d'Este. Here both water and vegetation were freely used and the natural contour of the site was turned to magnificent advantage. To gain the water effects that made the garden supreme Oliveri diverted the River Anio. Although the plan is definitely rectangular, its execution was followed through with a lighter hand. Rushing water was made to play tricks. Groves were peopled with statuary and grottos inhabited by animals and deities. The rondel of cypresses, so much admired today, was not a part of the original scheme, nor were the hedges left unclipped nor did the parterres lack flowers. As first designed, this garden was a series of terraces and ramps, covered with beds of clipped laurel and myrtle and vaults of verdure, so that the effect viewed from the long terrace of the villa—originally over twelve-hundred feet long—was of a great sea of vegetation spilling by successive green waves down the hill-side.

The rage for villa building extended to all parts of Italy through the 17th and 18th centuries—around Milan and Genoa and on the shores of the northern lakes, in Garda, Maggiore and Como. Of these lake villas the best known is Isola Bella on Lake Maggiore, begun by Count Carlo Borremeo in 1632 from designs by Carlo Fontana and not reaching its completion until forty years later.

Ordinary Gardens

The gardens we have mentioned sketchily so far—a mere handful of scores that made Italy glorious in Renaissance times—fell into three general classes: the city garden, the country villa built solely for pleasure and the farm that began as a place which the owner visited in harvest times and of which he became so enamoured that he settled there permanently.

All three were imposing in size and represented lavish expenditure both for making and maintenance. All of them were "backgrounds for lives of luxurious culture." Not a few of them proved to be merely gorgeous settings for costume pieces.



A GERMAN PATTERNED GARDEN OF THE 17TH CENTURY

What kind of garden did the ordinary person have in those days? The merchant class, for example, which was growing more comfortably off?

It is conceivable that the style for formal gardens percolated down to this group, that, when they had made enough money to own a villa and a garden, they patterned them after the manner of the noble places. The peasant and ordinary person, however, is rarely touched by changes of taste. These influences rarely approach his homely humdrum life. If he is slave to anything, he is slave to his environment. His garden is made according to the lay of the land he is fortunate enough to possess, and its planting according to the trees, vines and herbs that the climate will permit him to grow successfully.

The peasant's garden, as found today in various parts of Italy, is practically as it has been from the beginning of time. In the north it consists of a hedged or crudely balustraded plot for vegetables, which a vine-roofed pergola to afford him shade and pots of flowers set about by his women folk to delight his eyes. In southern Italy and Sicily the garden may be enclosed in a walled square in front of the house, or it may climb up the slope of a terrace. Where the slope is steep, great dry walls, connected by little steps, support level terraces. In such gardens Nature is free and the plant material diversified.

Italian Renaissance Botanists

There was a time in the 15th century when even the gardens of the nobility could boast a great variety of plants; in fact, some became veritable museums of vegetation. This was the dawn of the era of exploration, when returning mariners brought back then unknown trees and shrubs and flowers. Plant importation and collecting became a fad. The palm was introduced at this time and the cactus and other exotics. It also became the fashion to try old plants in new sections. Thus in 1466 Filippo di Matteo Strozzi brought artichokes and fig trees from the south into the north of Italy, and succeeded in acclimatizing them. Both men and women of the nobility aspired to fame for their horticultural achievements. One of the proud boasts of Isabella d'Este was that she had "the green thumb" and could make any kind of strange plant flourish. Lorenzo di Medici was an enthusiastic student of botany and in his garden at Coreggio he assembled an impressive collection of plants. This pleasant excursion into plant diversity came to an end, alas, when architectural formality laid its hands on the garden.

However, there arose a type of student who was not to be bound by the fashion of the moment. During the Renaissance the medical profession once more regained its honourable place and the botanist grew to be a man of importance.

Italian botanists of the Renaissance first devoted most of their time to identifying the plants mentioned by the classical writers, a fairly simple task, as the flora had not changed. Having accomplished this, they turned their attention to native plants these writers had overlooked. Thus Pierandrea Mattioli (1501–1577), the Sienese botanist-physician, published in 1544 his "Commentarii in Sex Libros Pedacius Dioscorides." He used Dioscorides' Materia Medica as a basis for his studies and also described many plants not recorded by him. The book met with instant success. Many editions were exhausted—thirty-two thousand copies of the earlier issues being sold—and it was translated into many languages. To this glory Mattioli could add the reputation for growing the first horse chestnut in Italy, seeds of it having been sent him from Greece. Shortly thereafter it reached England, for the tree figures in Gerard's Herbal.

Late in the 15th century was published a Latin work destined to influence botanical studies: the Herbarium of Apuleius Platonicus. The author was evidently a native of Africa and his writing is believed to have dated from the 5th Century A. D. In these intervening years, as we saw in Chapter VI, it had existed only in manuscript.

Mattioli's popularity was almost equalled by Castor Durante's

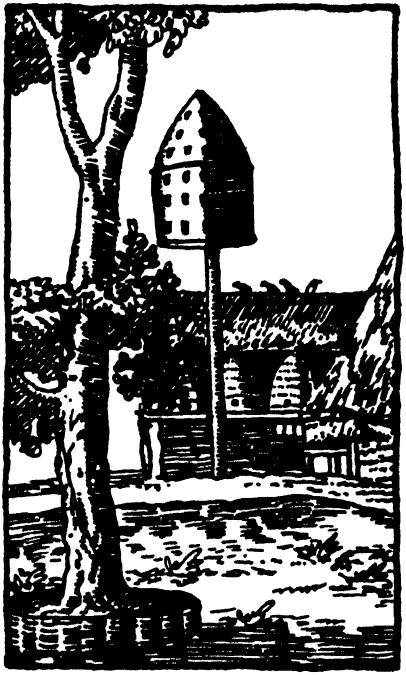
"Herbario Nuovo," 1585. Another which he wrote appeared in the German translation under the title of "Hortulus Sanitatis." A third important Italian Renaissance botanist was Fabio Colonna (1567–1650), a Neapolitan lawyer and amateur student of plants, who tried to correct the plant identifications of ancient writers in his "Phytobasanos," published in 1592. It was the first botanical work, incidentally, to be illustrated with etchings on copper. From Italian sources was derived an early French herbal, "Le Grand Herber," which in 1526 was translated into English under the title of "The Grete Herball." To still another Italian, Andreas Cæsalpinus (1519–1603) we are indebted for an early exposition of theoretical botany, in his "De Plantis." A century more was to pass, however, before Marcelle Malpighi began his studies of plant anatomy and gave the world its first notion of the colouring matter in plants.

From an interest in native plants, the curiosity of botanists began extending to plants of other lands. Just as over a thousand years before Greeks and Romans had brought from Western Asia the cherry, peach, pomegranate, walnut and cabbage rose, so did these 16th century Italian plant students introduce from Asia Minor, the Caucasus and Persia many plants—*Rosa lutea, Hibiscus syriacus and Jasminum officinalis* among them.

Prospero Alpinus (1553-1617) is remembered for introducing Egyptian plants and writing on them. He had been physician to the Venetian consul at Cairo, where he devoted himself to studying plants, and on his return he became Professor of Botany at the University of Padua. Here in 1533, at the suggestion of Francesco Bonapede, there had been founded a Chair of Simples, the first of its kind in Europe. And here the garden—the first botanical garden for public study—was laid out. Thereunto there had been only private botanical collections made by physician-botanists.

Some of them later developed into municipal physic gardens. To the garden at Padua, Alpinus brought his Egyptian plants. He also lays claim to have first described coffee. (Our first description of tea, by the way, was written by an Arabian merchant who had reached China about 850 A. D. And the first authentic account was by Jacques Bontues, a Dutch physician long resident in Batavia, in 1631.)

The original purpose of these botanical gardens was to protect doctors and apothecaries against ignorant and unscrupulous drug-sellers and root-diggers. They logically started at universities, since there, also, were the schools of medicine. For a long time botany and medicine were taught by the same professor. Often the gardens were used as class rooms. From this simple beginning of being merely a garden of medicinal herbs, they soon expanded to include other plants, as exploration and commerce brought them in.



TURF SEAT, DOVE-COTE AND BEE-HIVES IN A 16TH CENTURY GARDEN

The claim to the first of these botanic gardens is made by Hamburg in 1316. Salerno had one about 1340 and Venice in 1533. These were probably privately owned. After Padua, gardens sprang up with speedy succession. Florence opened hers in 1544 under the patronage of Cosimo de Medici; Bologna three years later. In 1560 Gesner laid out one at Zurich and ten years after this Paris planted its garden. In 1593 Monpellier dedicated hers, under the royal direction of Henry I. This university contained a medical school, founded as early as the 12th century by Jews who had been educated in the Moorish universities of Spain. By the 16th century it was attracting scholars from all over Europe. William Rondelet was its great botanical teacher at this time. The University of Leyden claimed a botanical garden in 1577, Leipzig in 1579, Oxford in 1621, Jena in 1624. Then came Upsala in 1657, Chelsea in 1673, Berlin in 1679, Edinburgh in 1680, Amsterdam in 1682, St. Petersburg in 1714, Vienna in 1754. America's first botanical garden was planted by John Bartram at Philadelphia about 1731. Cambridge University began its garden in 1732, Dublin in 1790, Geneva 1822 and Glasgow in 1817. And, to show how far this passion for botanic gardens could travel, we might note that as early as 1685 the Dutch East India Company had a thriving botanic garden at the Cape of Good Hope.

Italian Gardens Travel to Spain

Since the Italian was the first important garden development of the Renaissance and since Italy was sought out as the source of inspiration, this type of garden was soon exported to other countries. And each country, in turn—Spain, France, Germany, Austria, Holland and England—was to interpret it in its own vernacular.

Spain superimposed it on the ruins and remnants of the Moorish taste—Charles II in the palace he built on the Alhambra hill, Philip II in the Escorial, that combined palace and monastery in which he set up no less than seventy-six fountains and as many statues, most of them treasures imported from Italy—and the same Philip in the re-built Alcazar with its figures of Roman emperors to give the authentic touch. Countless grandees, following the example of these kings, tried their hand at reproducing the Italian garden on Spanish and Portuguese soil.

Two features the Spaniards appear to have contributed. They took in dead earnest the custom of having outdoor theatricals and garden fêtes, which the D'Este family had commenced in Italy, and they brought it to an extravagant and sublimely beautiful habit. Court life centred around these great garden parties, court life and all its romance and intrigue. In fact, so extravagant did some of these Spanish fêtes become that those who took part in them were usually in need of spiritual washing when they woke up the following week. And this gave rise to another custom.

On both the larger and smaller places it became usual to build picturesque hermitages and chapels. The importance of one's garden was calculated by their number. Also a fine authentic touch was to provide real hermits and priests living in these garden abodes. The Spaniards evidently figured that if it was necessary to provide bathing tanks in which to lave the body, how much more necessary was it to provide spiritual fountains in which to cleanse the soul! So the week after the fêtes, these hermitages and chapels were usually well patronized.

New Plants from the New World

The Spaniards and Portuguese did not follow too slavishly the Italian custom of restricting the plants in their gardens to those that would contribute architectural effects. These were the two great adventuring people of the times. Their seamen were exploring the farther reaches of the New World and the Orient and bringing back many strange plants. Indeed, one of the ways an explorer could prove that he had been to a new country was by returning with an adequate assortment of seeds and slips that had never been seen before. These the Spaniards grew in their gardens and from them distributed samples to other parts of the Continent.

Thus the canna was sent to Spain and Portugal by the Conquistadors and grown for its seeds, which were made into rosary beads. In the same way tobacco and many another plant, even the dahlia, came to be introduced. A report on these plants was published in parts from 1565 to 1571 by a Seville physician, Nicholas Monardes, whose name is remembered today in *Monarda didyma,* Bee Balm or Oswego Tea. Monardes' book was called "Dos libros el veno que trat a de to das las cosas que traen de noustras Indias Occidentales." Later it was Englished by John Frampton, a London merchant, under the title of "Joyful newes out of the newe founde world." Among other accomplishments, Monardes gave the name nasturtium to Indian cress. He also wrote a full account of tobacco. This was not the first mention of it, however, since an Italian, Jeromo Bensoin, who was in America from 1541 to 1556, reported it in his "Natural History of the New World," in 1556, under the Indian name of *petun,* and also described how the Peruvians chewed coca leaves. Many generations were to pass before physicians discovered the medicinal properties of these leaves and gave sufferers the beneficence of cocaine.

And while we are mentioning Spanish books of this period, we should not forget that Spain found pride in an agricultural writer she dubbed the "New Columella" after the first, who was a native of Cadiz. Gabriel Alonso Herrera was his name, and he flourished at the end of the 15th and the beginning of the 16th centuries. While professor at Salamanca, he wrote "Obra de Agricultura Copilada de Diverses Autores," 1513, which, as the name implies, was a survey of all agricultural knowledge. No less than twenty-eight editions of it followed.

Gardens the Conquistadors Made

To the farther reaches of her new colonies, Spain's Conquistadors and their associates carried the contemporary Iberian taste for gardens. At Ciudad de les Heyes, the new Peruvian capital Pizarro built in 1535, the streets were purposely laid out wide enough so that there would be room for both public and private gardens, with conduits to furnish water to them.

The Conquistador's home was fairly simple—a large patio enclosed on all four sides by pillared corridors that gave access to adjacent rooms. On the street side was the zahuan or entrance. The patio had its fountain of glazed tiles, with majolica pots standing about. Later it became fashionable to place in each of the four corners tiled well-curbs, matching the central fountain, to hold trees and flowers. The influence here was obviously Moorish. Because of the heat, these formal gardens avoided open spaces such as lawns. Fruit trees were grown in abundance. Such a place Cortez built in the 16th century in the suburbs of Mexico City—La Tlaxpana, he called it.

The Church soon acquired magnificent and extensive gardens. The Dominican house at St. Jacintho, so the pseudo-monk Thomas Gage relates, had a garden of fifteen acres divided into shady walks under orange and lemon trees, and with pomegranates, figs, grapes and native fruits growing in abundance. Of the monastery gardens the most famous were those attached to the Convento del Carmen in San Angel. They had many fountains and well-stocked ponds, and their fruit trees were so well cultivated as to bring an annual income of 13,000 pesos.

This interest in fruit was literally to attain a golden age in the 18th century. The orchards, up to that time mere jungles of trees and flowers, were subjected to the influence of France and Italy that brought formal order out of their chaos. Indeed, most of these later Colonial gardens had a strict symmetry: a square plot with a central fountain around which ran a parapet two to three feet high; flower beds similarly enclosed—so that the entire design represented patterns on a tile. Statues and tiled seats abounded and along the parapets were ranged choice flowers in pots.

Among the famous gardens to be established toward the end of the 18th century was the one made by Don Manuel Marco de Ibara near Tacuba. The Jardin de Borda, laid out in the same era by Don Manuel de la Borda in Cuernavaca, at the cost of a million pesos, was to rival the Generalife, so beautiful were its terraces, arcades, pergolas, arbours, basins and fountains.

Another field of development was the lower part of the Atlantic seaboard, on the coast of what are now the states of Florida and Georgia. The Spaniards found the Yemassee Indians dwelling in villages and living by tilling the soil. Adalantado Menendez de Aviles established St. Augustine and the missionaries began building their outposts along the coast. They made their churches and garden walls of tabby—a concrete mixture of oyster shells and lime—and within the enclosures grew the ordinary crops, and eventually brought their peaches, olives, dates, figs, pomegranates, oranges and lemons to a high state of cultivation. Some believe these missionaries introduced the Cherokee rose, the favourite and most abundant rose in the South. By 1572 Spanish farmers were settled in lower Georgia and, so a traveller reports, soon had good crops of corn, lettuce, cabbage, radishes and pumpkins.

French Renaissance Gardens

The Italian garden came to France first by force of arms and then by force of overwhelming culture.

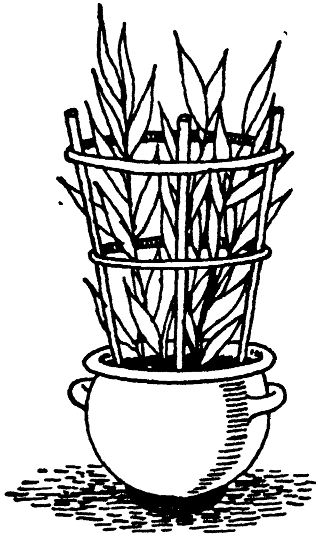
As Charles VIII was marching triumphantly through Italy in 1495, he was also capitulating to the beauty of the villas and gardens. When he returned to France, he took along with him, as part of the cultural loot that included books, pictures, statues and tapestries, twenty-two Italian artists and a Neapolitan gardener, one Pasello da Mercogliano. These he housed at the Château d'Amboise, resolved to make that castle glitter with unforgettable magnificence. Three years later, on Charles' death, his successor, Louis XII, took up the work, so that at no time during a stretch of eighty years were improvements and enlargements ever entirely halted.

Nor did the gardener Pasello waste much time. First he enlarged the garden and put in lattice and pavilions and an orangery—the first in France. Under Louis he laid out a gallery at Amboise, and at Louis' other estate—Blois—built a terrace. From views we have of it, we can see that Blois consisted of three principal gardens together with several smaller ones. Each of the flat flower parterres was enclosed by a low wooden railing, the whole surrounded by an architectural wooden gallery—a *galerie de charpenterie*—on which to train plants.

Even under the influence of his imported Italian artists, Charles had refused to surrender his native castle for the open country house of the south. For a long time the French clung to mediæval battlements and encircling moats; in fact, they clung to moats up to the 17th century. They kept the gardens strictly and formally within the walls. When they did venture beyond them, the gardens they first laid out bore little or no relation to the buildings; they were separate and self-contained.

The king having set the example, his courtiers soon took up the challenge. Garden making in Renaissance France, as elsewhere, soon entered on a competitive phase. Louis XII's garden at

Blois found stiff competition in the château and garden at Gaillon, the sumptuous residence that Cardinal Amboise, Louis's Prime Minister, built near Rouen on the Seine. This ambitious project was being carried on from 1497 to 1510—at the same time that, in Italy, Guilio de Medici was throwing all Rome into ecstatic envy with his Villa Madam. Amboise imported Genoese sculptors to make him a three-tiered fountain. He also had box-edged beds laid out in the shape of coats of arms, some planted to flowers, some made of tamped clay and different colours of pebbles, slate and shards of terra cotta. In the middle of the garden was a little pavilion with four little corner bird-cages. The walks were shaded by round-top vaults of pleached trees and vines. These leafy tunnels were called *berceaux*.



FLOWER SUPPORT FOR POTTED PLANTS

Among the many Italian artists who carried Italian Renaissance taste to France were Vignola, Serlia and Il Rosso, and these, in turn, handed on the tradition to French artists, as we shall see, to Pierre Lescat, Jean Goujon and Philibert de L'Orme. During those decades when France was warring with Italy and annexing and losing northern strips of the peninsula, French students flocked in droves to Italy. The subsequent peace found their numbers increasing.

Before long France had evolved its own type of garden. Gradually the isolated garden was connected with the house. Thus at Bury, near Blois, Florimont Robertet, who had been ambassador in Italy, brought back ideas he incorporated in his estate. While he still clung to a moated castle, he had a kitchen-garden laid in relatively convenient proximity to his kitchen, and in front of the castle a terrace of geometric beds. He also turned the corner towers into summer-houses. In English walled gardens today and in American gardens patterned after them, the summer-house built in the corner of the wall continues Robertet's heritage. And Robertet (although he may not have been aware of it) was following the style of the Indian Emperors, when they built *baradari* into the corners of their garden walls.

It is often interesting to halt in the progress of this story and wonder why men at certain times are attracted in garden making. What are the impelling motives? Often it is the desire to exhibit the vastness of one's possessions and thereby one's importance and power. We do not look for any deep-seated love of flowers and trees and shrubs to influence them, although at all times there are individuals to whom such horticultural matters are of great importance. Many of the French kings, Henri IV and Louis XIV especially, but even more so the queens, Catherine de Medici in her Tuileries garden and Marie de Medici in the Luxembourg, showed a deep love for gardens and gardening. Sport was another deciding influence. Just as hunting became a leading diversion in Persia and brought about the great hunting parks, so did enthusiasm for the chase cause French kings and the court to make hunting preserves and build lodges in them. In the Bois de Boulogne Francis I built "Madrid," a lodge that showed Spanish influence, traceable to his incarceration in Spain. Fontainbleau and Versailles likewise began as hunting lodges.

It was during the reign of that pleasure-loving sovereign, Francis I, that the arborvitae was first brought from Canada to Paris, whence it was distributed and eventually used in gardens all over the Continent. This was probably part of the spoils from Cartier's expedition. About 1550 the white pine was also introduced. France began to take a lively interest in evergreens. In 1553 Pierre Belon wrote his "De Arboris Coniferis," the first treatise on conifers. A French traveller, André Thevet (1502–1590) first described the peanut. By the middle of the 17th century quite a number of North American plants were being tried out in Paris, as Jacques Cornut attests by his "Canadensium Plantarum Historia," published in 1635. Paris itself began to flourish with palaces and well-designed grounds. The garden of Vanquelin des Yneteaux was famous for its fruit and vegetables, and by 1642 botanically-minded students sought the gates of Nicholas Houel's place. The grounds of the Abbey of St. Denis had elaborate parterres and orchards and avenues laid out in the shape of a cross. Philibert de L'Orme designed the Tuileries for Catherine de Medici, and for it Bernard Palissy conceived a ceramic grotto. His life and works are worthy of a new paragraph.

French Garden Makers and Writers

Bernard Palissy (1508–1589) was one of the universal geniuses of his time. Like many a gardener before him and since, he suffered for his religious faith. His Protestant beliefs kept him out of favour with the Court, caused him to be thrown in prison and even threatened his life, and yet this persecution did not dim his artistic ardour. In 1563 he published a treatise, "Receipts Veritable," in two parts. The first was devoted to agriculture, and the second was known as "The Delectable Garden." In this he describes a place he had made at Chaulnes in Normandy, a place fantastically beautiful with a *cabinet de verdure* or natural summer-house, a surprise fountain and caves in the hills behind in which to winter tender plants. But most of all he expatiated on grottos, on ceramic grottos especially.

Due to his influence, the grotto soon became a competitive feature and artists strove to outdo each other in building them, making them more and more fantastic as the craze proceeded. Some were large enough to hold quite a company of people, and it was not unusual to give theatrical performances in them.

This also was an age of topiary extravagance. The vegetable sculpture outstripped even the most ambitious dreams of the old Romans. The whole plant world was subjected to the topiarist's knife. At the Tuileries, in addition to elaborate *compartments de broderie* by Claude Mollet, and Palissy's grotto, and rustic tables made of branches, and fountains galore and a menagerie—that invariable accompaniment to princely estates—there was a labyrinth made of bent cherry-trees. In many gardens alleys of trees planted close together were so entwined and clipped that they made a solid wall. At intervals these walls were elaborated into summer-houses, having windows and doors and floors paved with cut stone or brick.

While we may look upon this as artificial and silly, let us not forget that topiary work of this kind was neither easy to make nor easy to keep. It required great horticultural skill and infinite patience.

Turning the century into 1600, the leading garden designers in addition to Palissy are Olivier de Serres, the three Mollets and Jasques Boyceau, Sieur de la Baradiere. Each of these contributed valuable features that were to make French gardens distinctive.

Olivier de Serres (1539–1619) was a practical horticulturist and author of "Le Théâtre d'Agriculture," a book that was to exert great influence on France. He departmentalized the garden into several sections, each with a purpose—the kitchen-garden, the flower, the herb, the fruit. The orchard and kitchen-gardens occupied a large share of the space. Flowers were to be grown in a pattern or parterre, with lavender, thyme, mint and marjoram for edgings, and were designed to contain only such low-growing plants as would not reach too high and spoil the carpeting effect. This garden was designed to be enjoyed from above; consequently, it was made of fairly low flowers such as violets, wallflowers and pinks, with occasional beds of different coloured earths. At the corners stood clipped cypresses for accents. Seats and figures would be fashioned out of other clipped material. The herb garden, in which to grow the family's supply of simples, was made a feature. De Serres also wrote a treatise on the silkworm in 1599, and he founded the first experimental farm of which we have record, at his home near Pradel.

Forty years after Serres, Jacques Boyceau published his "Traité du Jardinage." He was gardener to Louis XIII and Louis XIV and laid out parterres at the Louvre, Tuileries, St. Germain-en-Laye and Versailles. In his book he made a further bid for fame by explaining his theories for elaborating the parterre. While Serres had conscientiously divided the garden into several rooms according to their uses, Boyceau claimed that gardens should have only two divisions—the useful and the beautiful, the kitchen-garden and the pleasure garden. On small places these could be combined. With Boyceau's name we also associate the arabesque form of parterre design.

Up to then the pattern of flower beds had inclined more to angles and squares. Boyceau introduced the curve. Or he may merely have been crystallizing contemporary taste. Already there had appeared a style of garden design known as *compartiments des broderie.* Flower embroideries became fashionable for dress goods, upholstery and curtains. When the smart designers had exhausted common flowers, they sought abroad for inspiration. Between the craze for embroidered flowers and the demand for new inspirations for floral designs, there began to spread over cultural France a quickened interest in all kinds of flowers.

Thus France was not slow in following Italy's example of collecting exotic plants. Many of the larger places vied with each other in assembling them and some members of the Court actually became intelligent about new plants and their cultivation. A hundred years after the first botanic garden was planted at Padua, as we have seen, Paris set up its Jardin des Plantes, which took the place of a little physic garden founded in 1597. Three years after this second garden was founded it could count eighteen hundred specimens in cultivation. By 1665 this had risen to four thousand. Its first curator was Jean Robbins, a learned and generous man, who freely distributed his seeds and plants on the Continent and in England. This institution has ever since carried great weight in the botanical and horticultural world.

Ten years after Boyceau's book, appeared another—"Le Théâtre des Plantes et Jardinage"—from the pen of Claude Mollet, the king's gardener. Mollet came by his interest naturally, being descended from a famous gardening father, and his sons were to follow him. The first of the line was gardener at the Château d'Anet, a place famous for its architectural garden galleries that L'Orme designed and where Mollet assembled a remarkable collection of plants. He later rose to be designer of the royal gardens. The second of the line was his son Claude, who succeeded his father in the royal gardens and later worked on the parterres of St. Germain-en-Laye, Monceau, Fontainbleau and the Tuileries, where he introduced box for edgings and high box hedges between parts of the garden. His parterres were a study in plane geometry. But for all his formal designs, he did not forget horticulture. He insisted that gardens should be planted to produce succession of bloom.

This Claude, in turn, left two sons, both famous gardeners in their time—Claude Jr. and André. The latter was appointed head gardener to James I of England and in 1651 published "Le Jardin de Plaisir." He has been called "The Father of the Avenue," for he stated that, whereas the rear of the house should have its *parterre en broiderie,* the front should be approached by single, double or triple avenues of trees, according to the size or pretension of the building.

Although under the leadership of such men France was developing a distinctive form of garden, Italian influence was still making itself felt. The gardens at Fontainbleau, for instance, were renowned for an extensive parterre. When Henry IV desired to rearrange this, he called on the services of the Italian *fontainier,* Thomas Francini of Florence, who not only remade the terrace but also added canals and planted flanking avenues of trees. The garden at St. Germain-en-Laye in its later incarnation was definitely marked by Italian taste. Though Claude Mollet later had much to do with the series of terraces, alleys and arcades that led down to the Seine, the shell-work grotto and the fountains in them had been done by Francini whom Henry IV had imported from Italy for the job. When Catherine de Medici had Salomon de Bosse lay out the Luxembourg Gardens, she naturally leaned toward the style of her native land and made them reminiscent of those at the Pitti Palace. When Cardinal Richelieu set up his country place at Ruel, in competition with the Luxembourg, he made a feature of an Italian cascade.

Meantime the young Le Nôtre, who was to purge gardens of their Baroque exuberances, was growing in knowledge and stature; and René Rapin, the Jesuit poet-scientist, was publishing his

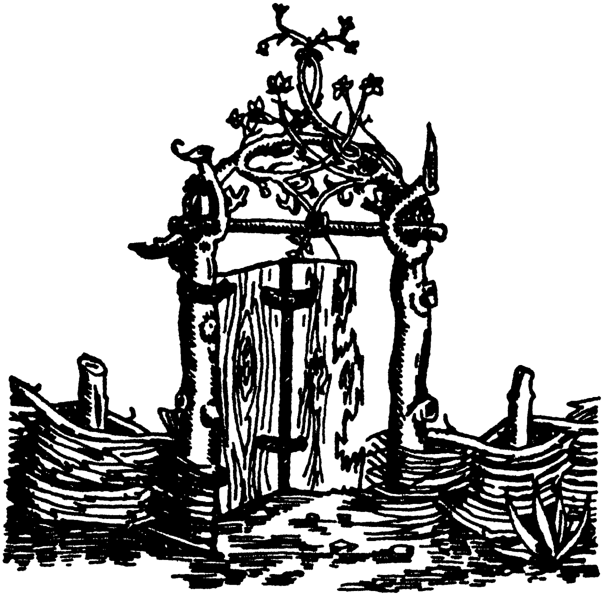
"Hortorum" in imitation of Virgil's "Georgics," a book that was to turn countryward minds in both France and England. He assures us, and rightly, that

> France in all her rural pomp appears
> With numerous gardens stored.

For a description of the average person's garden in Renaissance France, we open a fascinating book called "Maison Rustique," which appeared in 1570. It was written by Charles Estienne (1504–1564) and his father-in-law Jean Liebault, both doctors. Estienne had preceded this by publishing a work on agriculture, "Praedium Rusticum." The "Maison Rustique" was translated into English in 1600 by an English physician, Richard Surflet, and reprinted sixteen years later by Gervase Markham, who called it "a work of infinite excellencie." So popular was this work that it enjoyed no fewer than thirty French editions.

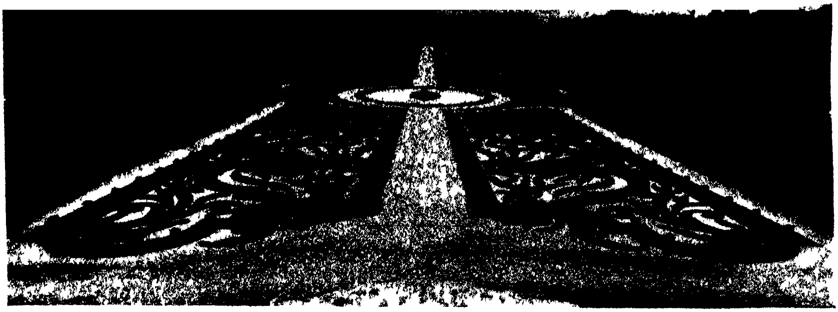
The ideal small garden that Estienne and Liebault describe is characterized by the French love of order. The estate is departmentalized and each part is easily accessible. The garden was divided into two main parts, separated by an alley of trees, and in the middle was to stand a fountain. On one side, surrounded by a hedge, was a square vegetable garden, with an entrance into the house, another into the orchard beyond and a third opening at the fountain. Pears, apples and cherries grew along the hedge. In the four corners stood vine-covered arbours. The vegetables were grown in long beds with 2-foot walks between. In some of these were the table vegetables, in others the pot herbs and on the orchard side the physic herbs. At one end was a low maze of camomile. Myrtle, orange, lemon and bay trees growing in tubs were disposed at regular intervals in this kitchen-garden. The pleasure garden was divided into two sections—the knot beds for little nosegay and garland flowers and other knot beds for the fragrant herbs, sweet balm, rosemary and such. In the corner, facing south, stood beehives and a gardener's cottage.

The vegetables grown in the kitchen-garden were the root crops —turnips, leeks, garlic and carrots. Peas and beans were sown in the field outside. However, as we shall see when we come to the English garden, there was no such variety of vegetables as we enjoy today. Hyssop, lavender, marjoram, sage, rosemary and thyme were the favourite pot herbs. The flowers grown for nosegays and garlands were violets, pinks, pansies, daisies, marigolds, lilies of the valley, anemones and Canterbury bells.



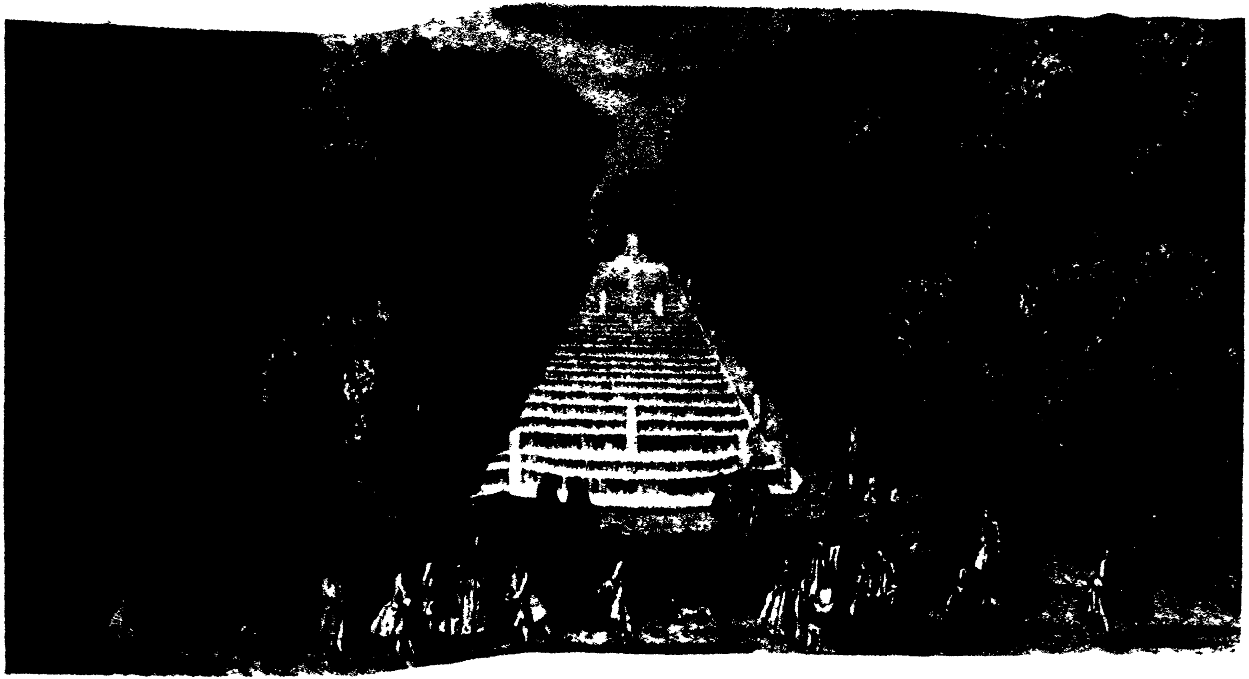
A RUSTIC GATE AND WATTLE FENCE 1520

For a delightful description of life on a French country place of



THE OLD-STYLE PARTERRE DE EMBROIDERIE, AT VAUX-LE-VICOMTE

THE OLD KNOT GARDEN REVIVED FOR A FLORIDA GARDEN, BY HOWARD MAJOR, ARCHITECT



THE CASCADE AT MARLY, A GARDEN OF THE TIME OF LOUIS XIV, WHICH WAS DESTROYED DURING THE REVOLUTION this period—a place that doubtless had a garden such as that described in "Maison Rustique"—we can open the Journal of the Sire de Gouberville, kept by him from 1549 to 1562, which Katherine Fedden has used for the basis of her "Manor Life in Old France."

Beside the "Maison Rustique" were other books the gardener might consult. He might enjoy the writings of André Mozault, whose collected works were first published in 1578. If he were a scholar, he certainly would study the pages of Geoffroy Lonicier's "L'Histoire des Plantes" and of Jean Ruel's "De Natura Stirpium." Ruel was a physician and professor at the University of Paris. His great work, which was a general botanical treatise, appeared in 1536. Fifty years later Jacques d'Alechamps (1513–1588), a physician educated at Montpellier and practising at Lyons, wrote a complete universal flora. The student would also seek the works of Jean and Gaspard Bauhin, who are considered later. He might glance into the early tome on grape-vine and fruit growing by Paulmier de Grenlemesnil, physician to Charles IX, and published at Caen in 1588; or the "De Hortorum Laudibus" by Cousin. He would also revel in the folios of contemporary garden views made by Androuet de Cerceau, "Les Plus Excellents Bastiments de France."

For the average intelligent gardener there were the simpler books, one of the earliest being David Brossard's "L'Art et Manière de Semer et Faire Pepinières." This work, on planting and grafting trees, written by a member of the Abbey of St. Vincent, was to enjoy an English translation in 1572 by Leonard Mascall. Fruit growing flourished in the religious establishments of France and from these orchards slips of trees were distributed over the Continent and sent to England. Another popular book of the period was Jacques Le Moyne's "La Clef des Champs," appearing in

1586. To induce the spread of silk manufacture there appeared the work on mulberry-trees and the care of silkworms by Olivier de Serres.

In the chapter on Mediæval Gardens we encountered two of the earlier Continental books written by French religious on the care and propagation of fruit trees. From then on the knowledge of this practice spread rapidly. In this later era comes Le Lectier, an attorney of Orleans, who began assembling a collection of fruit trees in 1598. Thirty years later he issued a catalogue. Could this have been the first fruit catalogue in France? At any rate, with this date began that rage for fruit growing which, in the century to follow, captivated every one from the king down.

Grafting was well understood and universally practised in the Renaissance. Artificial hybridizing of flowers, fruit and vegetables, however, was neither scientifically understood nor followed. It is amusing to read the scene in "The Winter's Tale" where Polixenes explains to Perdita about the striping of her gillyflowers. One would almost suspect Shakespeare of having knowledge far in advance of the scientists. However, it was not the sort of hybridizing we know, since most of the new kinds that appeared in gardens then were chance mutations or hybrids created by the bees or the wind. Perdita turned up her nose at them, saying they were "Nature's bastards!"

While Babylonians and Assyrians in working with dates were probably the first deliberate plant breeders, it remained for the Dutch Rudolph Jacob Camerarius (1665–1721), Professor of Natural Philosophy and Director of the botanic garden at Tubingen, first to recognize the sex in plants and to discover that pollen is necessary to fertilization. Joseph Gottlieb Kolreuter in 1694 pursued the same study, which we now call Genetics. In his time Francis Bacon prophesied that a great variety of new fruits and flowers would appear, and, he adds prophetically, "Grafting doth it not." The work was carried on in England by two 18th century students—Richard Bradley, Professor of Botany at Cambridge and Sir Thomas Millington, Professor of Natural History at Oxford. Meantime gardeners were making experiments. They believed that if they planted seeds of different kinds of flowers mixed together, variations would spring up. In 1682 Nehemiah Grew wrote his "Anatomy of Plants" which finally defined the sex functions of stamens and stigmas, and still, thirty-seven years later, when Thomas Fairchild, the London nurseryman, produced hybrid pinks by the use of pollen and thus began artificial hybridization, he, poor fellow, blushed for his work, believing it to be unnatural and immoral!

Gardening in Renaissance Germany

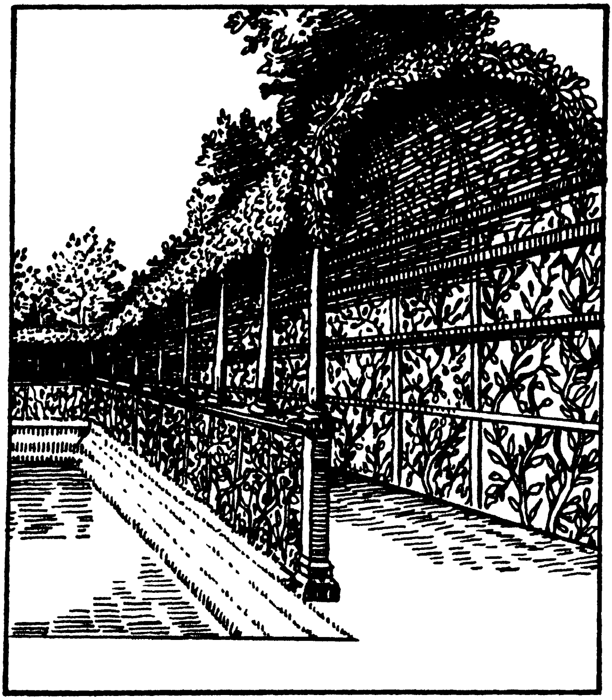
Just as French artists, doctors, botanists and men of affairs poured into Italy to study during the Renaissance, so did students flock from Germany, and on their return bring Italian ideas to the gardens and to German scientific lore. But whereas in France there eventually was evolved a French style out of this Italian influence, the Germans apparently brought about few native changes. The great gardens made during the Renaissance by German royalty and court followers were either Italian or French, many of them designed by Dutch artists. Only in the small town garden, in the garden of the well-to-do burgher, did there appear any native taste in design and selection of plant material.

This taste might be epitomized by the garden that Joseph Furttenbach (1591–1667) made beside his house at Ulm. He was an architect and he had been to Italy. His garden scheme shows two concessions to Italian influence—arboured walls beside the house and a miniature grotto-summer-house in one corner. Otherwise the rest of the area was paved, with long beds of flowers laid between the flagging. The London town garden of today with its stone paving is not unlike Furttenbach's; indeed, some of the most modernistic paved gardens of France and Germany might find a possible ancestor in his scheme. Furttenbach was ages ahead of his time in many respects. He even planned a school garden, where children might watch plants growing and be taught their cultivation and virtues. Only within our own generation have we succeeded in adopting this educational dream of school gardens. Furttenbach published two books containing designs for both large and small gardens. They were "Architectura Recreationis" and "Architectura Privata." His large gardens were formal, surrounded by a wall and moat and an inner hedge, and the house court, parterre, and more utilitarian orchard and kitchen-garden were all separate entities.

His predecessor in point of time was Salomon de Caus, who had much to do with laying out gardens around the castle at Heidelberg, which no longer exist. Views of them are preserved, however. Caus' career was quite checkered and eventful: he studied architecture in France, went to England as tutor to the Prince of Wales, where he published a book on English gardens and fountains, returned to Germany in 1615 to work on the Heidelberg commission, went to France four years later and received an appointment from Louis XIII, and there composed a tome on water ingenuities, "Les Raisons des Forces Mouvvantes."

The Teutonic mind relished these water tricks in gardens. Equally did it appear to enjoy exaggeration of any kind. When Teutons took to topiary work, they went positively gross—you entered one garden of this period between the legs of an enormous topiary Colossus!

In two other respects the Germans of the Renaissance made marked gardening advances—in their avidity for growing new plants and in their pursuit of botany. The first fashion was set early in the 16th century by William, Landgrave of Hesse, who supported a private botanic garden. By 1580 the first public garden of this kind was established at Leipzig. Others quickly followed. Thereafter garden owners maintained a healthy competition in collecting unknown flowers, shrubs, vines and trees. One achievement was reached in 1559 when Johann Heinrich Howard first flowered the tulip in his garden at Augsburg.



A COVERED GALLERY WITH OPEN SIDES DATING FROM 1600

The first writer on botany in this era was Basil Besler (1561–

1629), a druggist of Nuremberg, who founded a museum there and assembled a sizable botanical collection and in 1613 produced a quaint volume called "Hortus Eystettensis," a personal botanical gesture, for it describes plants collected by his friend the Bishop of Eichstatt. *Besleria,* a group of tropical American sub-shrubs, is named for this Nuremberg apothecary.

Prior to this date Germany had produced four great botanists. The line began with Otto Brunfels, mentioned in the chapter on Mediæval Gardens, who closely followed the lines of Italian botany. Next came Hieronymus Bock (1498–1554) or Tragus—his pen name—a strange combination of practising preacher, physician and working gardener, who in 1539 published "Neu Kreutterbuck." Contemporary with him was the Bavarian botanist Leonard Fuchs (1501–1566), remembered today in the Fuchsia, who wrote "De Historia Stirpium." This work is remarkable on several counts: it describes four hundred native and a hundred foreign plants, it set the style for describing plants, and it contained the first presentation of such American plants as corn and pumpkins. Fuchs was successively a physician and for thirty years Professor of Medicine at Tubingen and, in this time, suffered for clinging to his Protestant beliefs.

The Cordus, father and son, both contributed to German botanical lore. Henricus, the father, studied at Ferrara in Italy and came to Marburg to teach. Here he laid out a famous garden of herbs. His son, Valerius, departed from his father's medical interest in plants and studied them for their own beauty alone. Pursuing this course, he travelled widely in search of plants, Italy being his favourite field for exploration. In the course of his studies he came to be the devoted friend of Conrad Gesner, who, after Valerius' death, brought out the manuscript of his observations, under the accustomed title, "Historia Stirpium."

The fifth member of this German botanical hierachy was Joachim Camerarius the Younger (1534–1598) who, having travelled extensively, settled down at Nuremberg, where he cultivated his garden of rare plants and carried on an extensive botanical correspondence and exchange of seeds. In addition to bringing out an edition of Matthioli, he published in 1588 "Hortus medicus et philosophicus." For it Conrad Gesner did the drawings.

Conrad Gesner (1516–1564), a great Swiss botanist, was the inspiration and source of German botanical lore for many decades to come. He had studied medicine in Paris and returned to Zurich to teach and pursue his studies. A man of encyclopædic mind, he wrote a great natural history and projected an equally comprehensive work on botany, which he never lived to see published. From his "Horti Germaniae" we have a fairly complete list of the trees and shrubs grown in Middle Europe by the middle of the 16th century, as well as those growing wild in Germany and those that had been introduced there from Southern Europe, such as the Judas-trees, the bladder-senna, laburnum and chaste tree. At his death Gesner left some fifteen hundred drawings of plants, many of them original, which were to serve as illustrations in herbals for a century or more.

To Gesner, scholars flocked from all over Europe. Among them were the two French brothers Bauhin, sons of an Amiens doctor, caused to leave France because of their Protestant predilections. Jean and Gaspard were their names, and both were destined to make history in the botanical world. Jean studied under Leonard Fuchs at Tubingen, then under Gesner at Zurich and, for a time, until his faith caused him to flee France, was at the University of Montpellier and at Lyon helped d'Alechamps on his history of plants. Jean Bauhin is remembered for a universal history of plants, "Historia Plantarum," published in 1650, thirty-seven years after his death. It contains the descriptions of five thousand plants, of which thirty-five hundred are illustrated. His brother Gaspard Bauhin (1560–1624), after the fashion of the time, sought learning in several universities—Basle, Padua, Montpellier, Paris and Tubingen, and, having travelled in Italy, settled at Basle as Professor of Botany, Anatomy and Medicine. Gaspard influenced scientific thought by lucid explanations of species and genus. One of his works, "Prodomus Theatri Botanici," 1620, first gave the potato its botanical name, the name it still bears, *Solanum tuberosum.* His other work, published in 1632, was called "Pinax Theatri Botanici," and in it he described over six thousand plants, arranged in a methodical order. The latter was to find a wide reception.

These two Bauhin brothers might be termed Gesner's prize pupils. However, there were many others, and he not alone encouraged and directed the botanical studies of those who came from Germany, but he also defined gardens for them.

Gardens of the time, he said, fell into five kinds: household vegetable gardens with their vines and orchards; medicinal gardens; gardens for special and foreign plants; elegant gardens for the rich—with arbours and pleasure houses and amusing architecture of clipped and woven evergreens; and finally the great show gardens of royalty and the nobility, with their large buildings, their impressive water-works and courts for games. All these five types eventually were found in Germany. In fact, there were more gardens in Germany in the 16th century than anywhere else in Europe.

Dutch Gardens and Botanists

Like the German, the Dutch garden took its first pronounced form in the 16th century under Italian Renaissance influences, although the local interpretation of it was much simpler than that found in other countries. However, it did follow the follies of those countries into the baroque and rococo styles from which the small villa gardens, at least, had not entirely recovered until a few years ago.

This Italian influence was brought to the Netherlands by Jan Vredeman de Vries, a painter, sculptor and architect who had studied in Italy. In 1568 the first of his schemes for gardens appeared under the title of "Hortorum Vividariorumque Elegantes." They were decidedly Italian in style. When the Dutch came to copy them, however, they executed the work on much simpler lines. Rubens' garden, for example, which he made at his home at Antwerp, shows the Italian taste filtered through Flemish interpretation. De Vries' most extensive influence was felt in England, where his books in translation helped interpret the contemporary taste to the English.

Very early, Erasmus in his "Colloquia" had outlined the ideal small garden. It was to be made for fragrance and beauty and "the refreshment of the very Mind." A series of small patches, one contained herbs, each type of herb to its bed, and watered with narrow canals. There were the usual bird-cages and beehives. On the walls were painted realistic trees that gave greenery in winter and added what Erasmus thought to be the desirable arboreal touch. Centuries before, the Pompeians in painting vines on their little garden walls had practised the same subterfuge. Erasmus also suggested a kitchen-garden and a special area for herbs, and to the left of this place he marked a meadow for play and to the right of it a nursery for foreign plants.

By the next century Crispin de Pass, the Younger, was giving his conception of the gardens and the flowers suitable for them in a book called "Hortus Floridus," 1614. Two years later it was published in England and played no little part in bringing the Renaissance taste thither. His garden designs, made for the four seasons, showed a complicated pattern of beds of flowers and coloured earth and sand, with paths sanded or laid in brick, tile or stone, the whole surrounded by an architectural wooden gallery.

The Dutch gardens were the products of a pronounced environment. Because of the abundance of water, many of them consisted of little patches of soil surrounded by canals crossed by decorative bridges. Sometimes they went in for circular parterres. The fish pond became a feature, and the edges of canals were marked by stone or lattice rims. To prevent stagnation, the canals were set on varying levels, so that there was always the slow movement of water. This same omnipresence of water, together with the constant winds that sweep the Lowlands, prevented the use of many large trees. The Dutch, perforce, were obliged to find their vertical garden interest in quaint summer-houses and in clipped shrubbery. The latter topiary taste came to them from Italy via France and they handed the heritage on to England. Also in their little gardens they went in for such quaint toys as silver reflecting balls suspended amid the flowers, and lead and wooden statues painted realistically. Sometimes they even painted their tree trunks, slashing them blue and white.

Early in their history the Dutch began the commerce of plant raising and distribution. They assembled plant collections. Witness the story of Henry Munting. A persistent plant enthusiast, he spent a fortune on botanical journeys and in cultivating his rarities at his garden in Groningen. By 1646 in contained over fifteen hundred plants. The old gentleman's money was gone, so the State, with generous good sense, made the place a public botanic garden. Another botanic garden with a romantic history is Leyden's, which boasted six thousand plants growing in it in 1786. The

Amsterdam botanic garden was supervised first by Jan Commelyn and then by his nephew Gaspard. The latter in 1678 published a folio of engravings of rare plants under the title of "Hortus Amstelodamus." From this botanic garden came the first coffee-tree seedlings. Sent to the Jardin des Plantes in Paris, seedlings from these two were dispatched to the French West Indies in 1726, thus starting coffee cultivation in those islands.

One of the most romantic episodes in horticultural history was the tulip mania in Holland. This flowering bulb was first mentioned by Auger de Busbequius, ambassador of Emperor Ferdinand of Vienna to Suleyman the Magnificent. He first saw it about 1544 at Adrianople and took it to Vienna. In 1559 Conrad Gesner, the Swiss botanist, saw it blooming in a garden in Augsburg, Bavaria, and by 1561 Cordus pictured it in his history of plants.

Shipments of bulbs came into Holland from 1571 to 1593. They reached England in 1582 and in 1597 Gerard speaks of his "loving friend Master James Garret" having worked on them for twenty years. By 1629 Parkinson in his "Paradisus" listed one hundred and forty varieties. France was growing the tulip by 1607.

The tulip mania in Holland extended from 1634 to 1637, when, prices having risen to fantastic heights, the market broke. But this was not the only country to experience a tulip mania. In the Journal of the Royal Horticultural Society for September 1931, Arthur Baker describes the tulip rage in Turkey, which, together with Asia Minor, was the native heath of the tulip. In 1720 over eight hundred named varieties were listed, and very poetic names they had—Heart Reviver, Beauty's Reward, Soul of Colour, Fresh Breeze, Key of Pleasure, Pink of Dawn, Reed of Power, Lover's Dream, Ruby of Paradise and such.

The Turkish ideal variety had pointed petals in red and yellow, as contrasted with the rounded forms and white and striped tints popular in Europe. Rewards were given not only to the hybridizers of new varieties, but to poets also for verses written in their honour. No less than 1000 pieces of gold were paid for a single bulb from Persia. The Mayor of Stamboul was obliged to fix prices. One order for the palace garden ran to fifty thousand bulbs. Flower shows were held in gardens at night when tulips bloomed and awards made for new varieties displayed in them. The Moslem royal house of Osman chose the tulip for its symbol.

Dutch Colonial Gardens

The story of how Holland became the plant nursery of Europe is naturally linked up with the story of her colonies. The beginning of the 17th century saw the race for eastern trade start in earnest. Queen Elizabeth chartered the English East India Company on the last day of the year 1600, the Dutch established theirs in 1602, the French two years after this and the Danes in 1612. Part of the cargoes carried home by ships of these trading companies, as we have seen, were composed of new plants. While England was developing the American seaboard and penetrating to India, the Dutch opened up their own fields.

To their ports in the Far East the way lay round the Cape of Good Hope. In 1648 the *Haarlem,* one of the company's ships, was wrecked in Table Bay. The crew landed where Cape Town now is and forthwith began growing vegetables for their sustenance. Five months later they were rescued by a ship homing to Holland. On landing, they urged the company to make a settlement at the Cape so that ships could put in for fresh supplies of cabbages, carrots, turnips and peas. In 1652 two ships set out for this purpose. They were commanded by Jan van Riebeeck, who took gardeners along with him, and at Table Bay built a fortified settlement and planted a garden, a practical garden divided into squares by hedges of orange and oak and white myrtle clipped like box. Besides growing vegetables for ships, here were collected examples of the native flora. In 1679 the garden was further developed by Simon Van der Stek and his son Adriaan, into a pleasure garden where South African economic plants could be tried out and foreign plants acclimatized. From China and Batavia were brought scarlet hibiscus, blue hydrangeas, magnolias and palms: from Europe came vegetables, vines and fruit trees. Its superintendent was Hendrik Bernard Oldenland, a great botanist and gardener. So important was this garden and so deep the interest that in 1699 the governor, Willem Adriaan van der Stel, wrote a gardening calendar, giving directions for fruit and vegetable culture in South Africa. As in the colony at New Amsterdam, so here, the first gardens grew up as adjuncts to farms and orchards, very few of them were deliberately planned.

Soon after the settlement was under way, Cape plants began appearing in Holland. Justus Heurnius, medical director at Batavia, stopped off at the Cape and began collecting plants. The first mention of Cape plants is in drawings and descriptions reproduced in a 1644 edition of Theophrastus. Red hot pokers and two oxalis were among them. Twenty-eight years later Dr. Paul Herman, chief medical officer of the company, made the initial collection of herbarium material at the Cape. By 1678 Jacob Beyne in his "Centuria" stated that H. de Beveringk and William Bhyne were growing Cape plants in their gardens at home. The 18th century had scarcely reached its first decade when James Petiver of London published names of over a hundred Cape plants, among them being various aloes, mesembryanthemums, the Belladonna lily and nine kinds of pelargoniums; nerines, freesias, gladioli and clivias followed in quick succession. But the most interesting of these Cape exotics were the pelargoniums, the parents of our present race. Between 1672 and 1703 Holland imported and raised seeds of many varieties and by 1720 England was enjoying them too.

Not alone the Cape but China as well contributed to Dutch gardens. In 1690 G. E. Rumphius, physician-merchant in the company, wrote his "Herbarium Amboinense." He listed seventeen hundred and fifty different Chinese plants. *Azalea indica* and *Chrysanthemum sinensis*—the latter the ancestor of all our chrysanthemums—were first imported to Europe by the Dutch as early as 1680.

At New Amsterdam, their colony on the Atlantic seaboard, what little farming the first settlers attempted was quite primitive and much of it was performed by the women, since the men preferred to follow the Indian business of hunting and trapping for pelts. Not until 1674, when the English took over the colony, did agriculture improve. The Dutch influence on agriculture, which was very great, followed in the subsequent years. Yet almost from the beginning could New Amsterdam boast its gardens, made from the bulbs and seeds settlers had brought with them. An early visitor, Adriaan Van der Donck, says in his "Voyages," "The flowers in general which the Netherlands have introduced there are the white and red roses of different kinds, the cornelian rose and the stock rose; and those of which there were none before in the country, such as eglantine, several kinds of gillyflowers, jenoffelins, different varieties of fine tulips, crown imperials, white lilies, the lile frutularia, anemones, baredames, violets, marigolds, summer sots, etc. The clove-tree also has been introduced." They likewise planted wild flowers and shrubs from the meadows and forests into their gardens and their bouweries or farms. Van der Donck lists the vegetables they grew and the herbs, and says that "a chirurgeon, who was also a botanist, had a beautiful garden there, wherein a great variety of medicinal and wild plants were collected."

Governor Peter Stuyvesant is believed to have had flower gardens both at his farm on the Bouwerie and at his home, Whitehall, at the Battery. This same governor sent to the Leyden Botanic Garden for seeds and roots. He also spent leisure hours in the Sips garden, built in 1666 on what are now Jersey City Heights, which was famous even in those days for its abundant flowers. Another quaint record is of a widow Rapalje, who had a garden in what is now Brooklyn, which she cultivated all herself.

To these faint records we must add a significant fact—the record of the first agricultural and cattle exhibition in America. This was held in New Amsterdam on October 15, 1641, only sixteen years after the settlement of Manhattan. This was the ancestor of American county fairs and horticultural exhibitions.

Dutch and Flemish Botanists

The Dutch and Flemish pursued botany quite intensively and they gave three unforgettable names to the profession—Dodoens, Clusius and Lobel.

Rembert Dodoens (1517–1585) well deserves his title of "Father of Flemish Botany." He studied medicine at Louvain, travelled, studying, in Germany, France and Italy, from which tour he returned to his native Malines, where he became state doctor and won his laurels fighting plague and cholera. His first botanical work was produced in 1552, a study of fruits. He then wrote "Cruydeboeck," a popular local flora of Dutch plants along the lines of Fuchs' herbal. It was translated by a Dr. Priest into English, an unpublished labour that Gerard appropriated for much of the material in his "Herbal." Later Dodoens enlarged this flora into a more comprehensive volume, "Stirpium Historia Pemptades," 1554. This, in turn, was translated into French by Clusius and into English by Henry Lyte under the title of "A Niewe Herball."

The second of these three great botanists was Charles de L'Ecluse or Clusius (1526–1609). A professor at Leyden University, his fields of studies ranged farther than Dodoens'. First he wrote on Spanish plants, then on Austrian and Hungarian, and finally compiled all his knowledge into a noble volume entitled "Rariorum Plantarum Historia." In this he gave to the world descriptions of six hundred plants that had never before been described.

It was Clusius who is believed to have introduced the tulip into Holland and to have raised the first lilac in Europe, the seed having been sent him from Constantinople by Dr. von Ungnad, ambassador to the court of Suliman II. England lays a counterclaim to this, since the inventory of Edward VIII's garden at Nonsuch mentions six lilac-trees. However we do know that Clusius first displayed an interest in alpine plants, a taste that has since spread to many countries and countless gardens, in which the rock garden is considered the acme of horticultural endeavour. From 1573 to 1587, Clusius was court gardener to Maximilian II at Vienna, and there he found mountain plants being sold in the market. This set him to climbing the Tyrolean peaks and upland meadow for others. Many roots, auriculas especially, he sent home to Belgium, where they soon became popular. The Huguenots brought them to England.

The third of these Lowlands botanists, and the one to furnish a link with the next country under consideration, was Mathias de L'Obel or Lobel (1536–1616). He likewise was a physician-botanist, having studied medicine at Montpellier under the great Rondelet, who bequeathed him his botanic manuscripts. He practised at Delft and Antwerp and, during Queen Elizabeth's reign, went to England where he became superintendent of Lord Zouch's physic garden at Hackney. Later he travelled to Copenhagen, and eventually was made royal botanist to James. His main contribution to botany was studying and classisfying plants by their leaves. This system he explained in "Plantarum Sex Stirpium Historia," 1576. His first book, "Stirpium Adversaria Nova," was brought out six years before.

Besides these accomplishments, Lobel is remembered as being the botanist who discovered enough mistakes in the "Herbal" of John Gerard, the favourite English herbalist of the day, to set English students working on more correct lines.

CHAPTER XI

TWO CENTURIES OF ENGLISH GARDENING

THE English Channel saw the crossing of many garden influences—plants, gardeners, gardening books and garden design.

Of what Roman triremes brought and how Tudor gardens imported the later taste of Moyen Age France and Italy, we have already seen. While the English displayed a native tendency for gardening, not until the 16th century did they make any effort toward artistic arrangements in their gardens, and much of this taste came from the Continent. Since for centuries France and England were closely associated, what was found in French gardens was also apt to be found in English.

In his heyday Wolsey had developed Whitehall and Hampton Court, which eventually were taken over by Henry VIII, but under both owners the style was foreign. Henry's gardener hailed from France. Elizabeth, though an ardent and persistent guest at country places, preferred for her own residence the royal seat of Nonsuch, with its battlemented walls and pretty patterned gardens that might have been in the valley of the Loire. Theobalds, the estate of Lord Burghley, and the favourite haunt of the Stuarts, was more Italian than English. It had a water garden, labyrinths and a semicircular summer-house containing statues of the twelve Roman emperors resplendent in marble. For twenty years John Gerard was superintendent of the place. When Burghley's youngest son, the first Lord Salisbury, developed Hatfield in Herefordshire, he sent his gardener, the elder Tradescant, travelling around the Continent to gather ideas and plants. James I brought in Salamon de Caus, the Dutch, French-trained engineer and architect and a great "fountaineere," to work on the royal grounds at Richmond. Salisbury also employed him at Hatfield. His son, Isaac, constructed many water tricks in famous English gardens. James I, as we have seen, also imported André, son of Louis XIII's gardener, Claude Mollet, who made *parterres de broiderie* for the King and planted boskets or thickets in the formal manner. Beaumount, likewise a Frenchman, was gardener to James II.

While there was this persistent eddy from France, tides of garden taste crept in slowly along the English coast. Changes did not come overnight. A merchant adventurer, back in England after many years in foreign parts, might note some changes, but, in the main, gardens were as they had been a generation before. He would have noticed, however, that a great many more country places were being built and many more gardens laid out, quite a number of them for pleasure alone.

From the various influences flowing across the Channel—Dutch, French and Italian—and from her own predilection, England was evolving a garden style by the time of James I. It was a formal garden, and it was designed for the rich. Francis Bacon in 1625 conceived his princely garden as being a square of no less than thirty acres, four of them in an entrance green or lawn, six in a heath or wild meadow, ancestor of our wild garden, eight to side walks and twelve to the main garden. We read of this in his immortal essay. While his garden was never really reproduced, many details of it were to be seen here and there in estates developed subsequently.

The returning adventurer might note, for example, that garden paths were being featured. "Forthright" was the name for the main path, and it was wide enough for four to walk abreast, the side paths being narrower. Some of these paths were arched over into green tunnels or "covert walks," woven of hornbeam, limes, or willows and some of "Carpenters Worke" extending down the sides of the garden. Others were fashioned out of juniper wood and willows lashed together with pliant osiers and roofed and walled with vines.

The footways beneath them were sanded, gravelled, turfed or planted to a low-growing variety of camomile. As French influence began to make itself felt, these walks were tiled after the Continental style. By the late 17th century John Worlidge in his "Systema Horticulturae or Art of Gardening" was advocating that they be paved with flagstones.

The main forthright led from the terrace, which lay in front of the house. This was a wide gravelled area edged with plants and surrounded by a balustraded parapet, and commanding a panorama of the formal, patterned gardens below. Often this terrace was a flat stretch of lawn—a terrace style that England was to contribute. Sometimes the main path from this terrace extended even to the entrance of the property, where imposing stone or brick gate piers, surmounted by carved animals, displayed their owner's coat of arms on each side of wrought-iron gates.

Down this main path the eye was caught by such pretty Dutch trifles as discs of gilded and coloured glass hung on stakes amid the flowers for the sun to glitter on. Their descendant is our silvered gazing globe.

Lead ornaments were here, too, vases mostly, placed along the terrace and walks, some of them containing flowers. Later, in the reign of William and Mary, lead was to blossom out into more ambitious forms, into statues and portrait busts, which populated gardens just as they did in France.

In large gardens the mount was still featured. It was located either in the middle of the garden or else piled into a terrace against the wall. A summer-house surmounted it. Later William Lawson suggested that the garden have four mounts, one at each corner, and on each a little arbour. On extensive places a banqueting house topped the mount. This, in generations to come, was to be elaborated into a stately structure.

John Evelyn and John Worlidge both advise using hotbeds for raising exotic and tender plants. A few years subsequent, horticulturally venturesome souls were evolving the greenhouse. From this primitive beginning the structure grew into an orangery, an elaborate architectural building of stone or brick and with interior walls covered with landscape murals and all the amenities of a conservatory. From the time of the Stuarts on, this became a marked feature of large English gardens. On some estates the building was large enough to house quite a grove and the orange crop fetched a neat sum. The trees, grown mostly in huge boxes, were hauled outdoors in summer to decorate the garden paths. By 1683 Jan Commelyn's "Nederlantze Hesperides," which explains the growing of oranges and lemons, was translated into English and widely studied.

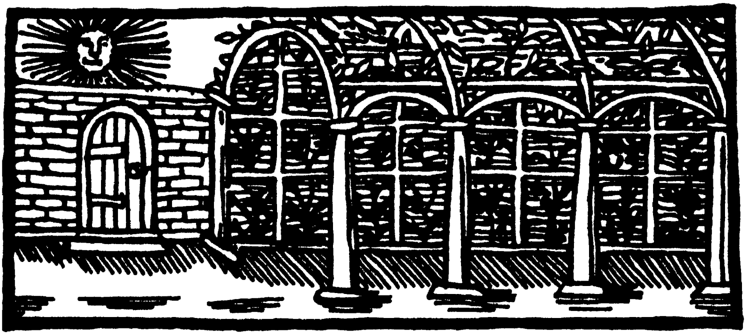
While raised beds were still to be found, the fashion for supporting them with low trellis fences was gradually passing out. Their place was being taken by the knot. Some gardens had "open knots," where the pattern was outlined by low, clipped box, daisies, lavender or pinks, and the flat colour found in vari-tinted soils. In others flowers were grown, but grown sparingly—those "delectable flowers to beautify and refresh the house" and used for nosegays and garlands. These made such "a brave checkered mixture," says Lawson in his "New Orchard and Garden," "that it is both wondrous pleasant and delectable to behold." Ribbon beds of hyacinths and tulips eventually appeared to satisfy those who could afford them.

Bacon snorted at these horticultural ingenuities, saying that you could see as good designs on tarts. Nevertheless the taste for them prevailed. After all, this was an age of knots. Did not the poets of the time—Donne, Herbert, Herrick and Vaughan—write just as complicated and pretty designs in their metrical pranks? What's more, the taste for them had come from abroad, and people quick to take up new styles simply couldn't resist the reports of these garden fantastics brought home by Englishmen who had made the Grand Tour of the Continent.

Whereas such affairs were once suggested for the rich only—for each knot was designed to occupy a space from twenty-five to a hundred feet square—by the time we reach that prolific writer, Gervase Markham, we find him suggesting them for the common people. Markham edited "La Maison Rustique" in 1616 and gave many practical hints for ordinary people. Let the gentry have their far-flung orchards, he said, their extensive knot gardens and ribbon beds and fountains; the average person need not be ashamed of a little knot made of clipped lavender or some such other easily grown herb. Advice like that was welcome, for the love of gardens was fast spreading about the country-side. By 1677 John Worlidge could write, "There is scarce a cottage in most of the southern parts of England but has its proportionable garden, so great a delight do most of men take in it." And ever since, the cottage garden has been one of the delights of England.

Up to the 18th century many of the best English gardens were still found within the limits of London itself. In 1722 Thomas

Fairchild was writing "The City Gardener." Yet even in the days before this, some of the streets were so crowded with houses that the flower-loving populace was forced to ride its hobby in window boxes. "Vinettes running in the casements," as the poet Lydgate called them. In his "Floraes Paradise," Sir Hugh Platt gives instructions for making and planting these window boxes. How picturesque and colourful they must have made the streets! And how much beauty London lost when she permitted the dense coal smoke to kill off these pretty decorations! It is also interesting to note that the Gardeners Company of London was founded by James I and given control over the produce from a six mile radius of the City.



GARDEN ARBOUR FROM HILL'S "GARDENER'S LABYRINTH," A 17TH CENTURY ENGLISH BOOK

But to return to the country garden. . . . The fountain still held a prominent place and the sun-dial was gaining in favour. "Water surprises," such as those found in Italian gardens, began to appear. And whereas once trellises and fences separated the different parts of the garden, now they were marked off by hedges of box, cornel, cypress, pleached fruit trees, juniper, privet, rosemary or thorn. Sir Hugh Platt recommends that these garden partitions be "made of laths or sticks, thinly placed, and after graced with dwarf apples and plomme trees, spread abroad upon the sticks." The maze was still found, planted with clipped hyssop, lavender cotton, marjoram, privet, savory and thyme. While these are useful herbs, Thomas Hyll solemnly assures us that mazes were used for people "to sport there at times." Equally popular was the taller labyrinth, which also often was made of pleached fruit trees. For those who enjoyed garden games, tennis courts, bowling greens and archery butts were still in fashion, and gardeners, always willing to receive tips from the players, saw that they were kept in good condition.

Topiary work, of course, flourished in the land and was supported by all the garden writers save Bacon, who considered such bush-barbering as only fit to amuse children. And when one reads Thomas Lawson's suggestions, he realizes that even for grown-ups the style was amusing—"frame your lesser wood to the shape of men armed in the field, ready to give battell; or swift running Greyhounds or of well-scented and true-running Hounds to chase the Deere or hunt the Hare."

On its culinary side the garden was beginning to show changes. The herb garden, still an essential part, lay behind its hedges, a square or rectangular place abundant with fennel, gillyflowers, lavender, marigolds, peonies, poppies and such, from which family medicines and flower waters were made. There were also beds of pot or kitchen herbs used in stewing and stuffing and the making of salads, and other fragrant herbs for strewing the floors. More attention was being given the raising of vegetables as such. Despite this, the English peasantry clung to its meat diet for a long time. The potato appeared in this age and the Jerusalem artichoke, and French beans shortly thereafter, although they were not relished by the masses for some generations to come. Seeds of good carrots, spinach, kidney beans and the tubers of sweet potatoes were found in the luggage of refugees and travellers coming to England. Melons especially began to catch popular support and many new varieties were grown. As the years passed and the common taste for vegetables increased, the kitchen-garden was to grow in size and the herb garden diminish.

The coming of Huguenot refugees was a great boon both to English gardening and agriculture. While the English gardener had always prided himself on his fruit, he was to learn many a profitable lesson in improved technique and new varieties from these French. Many more kinds of apples, apricots, quinces, pears, peaches and plums were grown. Dwarf fruit trees began appearing. By the middle of the 17th century the west of England had gained a wide reputation for its fruit. The grape-vine, however, which never did succeed outdoors in the English climate, gradually was discarded or went into conservatories. This era also saw many mulberry-trees introduced. Newly come from North America, their growing was encouraged by the Crown, which was anxious to establish the silk industry in England.

From Holland, too, many "delights" were imported, for the Dutch then held first rank as garden culturists and their influence was destined to humanize the English garden. Tulips, for example, came to England from Holland in 1560. Shortly thereafter John Tradescant could count fifty varieties of them growing in his Lambeth garden. The truce that James I negotiated with Holland in 1609 encouraged the importation from that country of both gardeners and plant materials. This Dutch influence increased as the 17th century advanced until it had reached full flood by the reign of William and Mary.

When speaking of plants grown in his time, John Parkinson divided them into two groups—English and "outlandish flowers," and with good reason; plant importation was very much on the increase.

In Marlowe's "Faustus" ran the promise—

> I'll have them fly to India for gold,
> Ransack the ocean for orient pearl,
> And search all corners of the new-found world
> For pleasant fruits and princely delicates.

The first importation of foreign seeds and plants by Raleigh was quickly followed by others. Raymond and Lancaster in 1591 laid the foundation for the East Indian Company, the fleets of which brought back new animals and plants. Merchant adventurers and men of means who supported explorations and underwrote commerical expeditions to other lands were awarded slips and seeds that they planted on their country places. By the 17th century the traffic was heavy indeed. Plant exploration and collecting was part of the duty of all travellers.

Stirring romance is attached to many of these plants. In 1618 John Tradescant accompanied Sir Dudley Digges to Russia, the first Englishman to investigate the flora of that country. He brought back many plants and seeds which he shared with his gardening friends and botanical correspondents. He reported that his garden was "supplyed by Noblemen, Gentlemen, Sea Commaunders, with such Toyes as they could bring or procure from other parts." Through his influence *Syringa Persica,* among other strangers, first appeared in English gardens. From Constantinople, a London merchant, Nicholas Lete, brought the first double yellow rose, and John de Franqueville, another London merchant, introduced the first double white narcissus. John Parkinson, the London apothecary and gardener, prided himself on growing rhubarb that came to him *via* druggists in Venice. In 1607 William

Bael was searching Spain for rare plants. Captain John Smith added generously from the rich stores of American meadows and forests.

Not alone did plants come from abroad, but English gardeners and botanists were also searching their own country-side to discover its floral wealth. Botanizing became a gentleman's sport, attracting such men as John Goodyer, James Cole and the Frenchman, Francis le Veau, whom Parkinson called "the honestest roote-gatherer that ever came over to us."

Gardening Books

This increased interest in gardening and Nature produced many books, and the books, in turn, spread the knowledge and interest even wider. The first were herbals of more interest to the botanically-minded than the lay gardener; then came practical gardening manuals of all sorts—the beginning of a book flood that has not diminished down to our own times. Standing apart from all of these were Bacon's Essay on Gardens and his "Naturall Historie," published after his death in 1627.

Although the "Grete Herbal," based on the "Hortus Sanitatis" of 1405 had appeared and Macer's "Herbal" in 1503, the attribute of "The Father of English Botany" was not applied until it was given to the Rev. William Turner (1510–1568). A preacher without license, a physician and student of botany on the Continent under the great Conrad Gesner, Turner eventually returned to England and became Prebend of York Cathedral and Dean of Wells. In 1538 he issued his first botanical work, a little list of plant names totalling twenty pages. His second was a list of herbs in Latin, Greek, French, Dutch and English, the first time common names were given. The third work, his "Herbal," came out in three parts until it was finally completed in 1568, the year of his death. Turner had his first garden at Kew and his second, and more important one, at Wells.

Contemporary with Turner was a brilliant galaxy: Thomas Tusser, John Gerard, Thomas Hyll, John Parkinson and William Bulleyn.

The last, a learned physician, laid claim to fame by writing in 1558 "The Government of Healthe" which, while discoursing pleasantly on herbs and gardens, also contributed to our knowledge of the fruit grown in England at that time.

Thomas Tusser (1523–1586), for ten years a retainer at the Court, retired to his farm in Essex and there completed his poem, "One Hundred Pointes of Good Husbandrie," 1557. Sixteen years later, after considerable moving around the country, he settled down again to enlarge this to "Five Hundred Pointes." His precepts, written in rhymed couplets, cover every phase of country living and work in a manner so practical and so bucolically simple and epigrammatic that one has difficulty in believing he was ever at Court surrounded by

Cards and dice, with Venus' vice.

Certainly his poems give us an authentic picture of the state of horticulture in Elizabeth's time as clearly as they served to stimulate the infancy of English farming.

In 1578 Henry Lythe published a translation of Rembert Dodoens' herbal, which, as students later found, was to inspire the writer of the next book, John Gerard (1545–1607). The not unusual combination of physician and gardener, Gerard had a garden at Holborn, then a fashionable district, and used to herborize around London. First he published a 24-page catalogue of the eleven hundred plants in his garden and, being the first complete list of the contents of a single garden, it was the forerunner of those "Finding Lists" that owners of well-stocked estates proudly publish today. In 1597 Gerard issued his "Herball or Generall Historie of Plantes." It actually was a compilation of Dr. Priest's translation of Dodoens' "Stirpium Historiae Pemptades," yet it met with popular acclaim. Lobel and James Garett corrected it and, some thirty-six years after the book first appeared, Thomas Johnson brought out an improved edition. Johnson was a London apothecary and physician who had a famous garden at Snow Hill and was ranked as the best herbalist of his time. He also caused Londoners to flock to his shop window when he displayed, for the first time in the city, a bunch of bananas.

PLEACHERS WORKING ON A GARDEN BOWER, FROM THE "GARDENER'S LABYRINTH"

The first of the practical gardening books was a small volume written by a London man of letters, Thomas Hyll or "Didymus Mountain" and published in 1563 under the title of "A Most Briefe and Pleasaunt Treatyse." Later it was called, "The Profitable Arte of Gardening." In 1577 appeared another, "The Gardener's Labyrinth." In these books he discusses not only the garden flowers in detail, giving instructions for their culture, but also supplies designs for knots, mazes and other features. His instructions are practical—he has a lot to say about watering and weeding. He believed in soaking seeds in scented water to give them fragrance, a practice that probably came from the East, and he laid great store by astronomical gardening—planting and reaping by moon phases a custom still held by country folks and not entirely beneath the consideration of even the scientific. There still may be something in it.

With John Parkinson we turn into the 17th century. A London apothecary, having a garden in Long Acre "well stored with rarities," Parkinson was one of the most popular horticultural figures of his time. First he had served as apothecary to James I and then as King's Botanist to Charles I. Among his plant introductions to England was the yellow Provence rose. His reputation is immortalized by two books—"Paradisi in Sole Paradusus Terrestris" (a play on his own name) 1629, and "Theatrum Botanicum," 1640. The latter concerns itself with botany and the medical properties of herbs. It is the former which bears, after these many centuries, a fresh fragrance of flower love and gives us unforgettable glimpses of his gardening friends.

Though Thomas Tusser had concerned himself with vegetables, the earliest book devoted entirely to that side of the garden was Richard Gardiner's "Profitable Instructions for the Manuring, Sowing and Planting of Kitchen Gardens," 1603. The author was apparently a "dirt" gardener with a weakness for lettuces and carrots. His ideal garden contained beans, beets, cabbages, carrots, gourds, marrows, onions, parsnips, peas, turnips and the usual salad, sauce and stewing herbs—all these, but not a mention of the potato! Sixty years later, however, John Forster was to devote an entire book, "England's Happiness Increased," to extolling this tuber.

Two other Elizabethan books of gardening interest were "A Short Instruction Very Profitable and Necessary," 1592, and "The Orchard and the Garden," 1597, both translated from the French. The first of these French gardening works to be translated into English, as we read before, was Leonard Mascall's "Booke of the Art and Manner Howe to Plant and Graff," in 1572, the original being by David Brossard, of the Abbey of St. Vincent.

After the turn of the century William Lawson, in 1618, published his "New Orchard and Garden"—a book both practical and helpful in designs, for the orchard was still part of the garden. The typical garden he suggested was oblong, with five squares devoted to fruit, and only one to a decorative knot. Mounts with summer-houses were at the corners, as we have read before, and in the middle stood a fountain. Thereafter the fruit books increased rapidly—John Bonful's instructions for planting and dressing vines, 1622; Ralph Austen's "Treatise of Fruit Trees," 1635; William Hughes's "The Complete Vineyard," 1670; and John Evelyn's translation of "The French Gardener," to mention only a few.

Another early 17th century writer was Sir Hugh Platt. His first book, "The Jewel House of Art and Nature," attracted attention in 1594. His second, "The Paradise of Flora," by which he is best known, appeared in 1600, with an enlarged edition, under the title "The Garden of Eden," in 1660. Platt was the ideal type of country gentleman. He maintained two country seats and a town garden in Martin's Lane, where he conducted his experiments, reports of which he communicated to botanists and gardeners everywhere. Sir Hugh was the first to specialize in manures and the plants best benefited by them.

Three other pens are found at work. In 1615 Crispin de Pass the Younger published at Utrecht his "Hortus Floridus," with English text, and later, in London, brought out his "Book of Beasts, Birds, Flowers and Fruit." In 1650 William Howe published his "Phytologia Britannica," in which, for the first time, indigenous plants, were classified separately from foreign. The third book was "The Scots' Gardener," 1683, written by John Reid, which attained merit by the fact that it was the first local gardening book fitted to the climate of a definite section. It also served to remind Londoners that gardening was going on in other sections beside the south of England.

The Tradescants

Although no gardening books are attributed to them, one family of gardeners left an unequalled impression on England at this time. The Tradescants influenced horticultural thought and practice for several generations, and their garden existed until 1749. They belonged to the ranks of what John Evelyn called "Paradisean or Hortulan Saints."

The first of the line, the grandfather, came from Holland in the time of James I. His son John began as a gardener to Lord Salisbury and, as we have seen, travelled on the Continent buying plants for the estate in Herefordshire. The expense accounts of this horticultural journey are still preserved. They were kept in meticulous detail as to what he bought and what he paid for it, from tulips at ten shillings the hundred up to rare *Iris Susiana* and orange and pomegranate trees. After Salisbury, he served the Duke of Buckingham, botanized in Russia, accompanied a military expedition to Algiers and travelled extensively elsewhere. Parkinson describes the father, John Tradescant, as a "painful in-

THE CHATEAU AND LITTLE PARTERRE AT MARLY, SHOWING THE FORMAL PLANTING OF A HILLSIDE

WINTER AND SUMMER TREATMENT OF ORANGES IN HOLLAND, AS DEPICTED IN JAN COMMELYN'S "NEDERLANTZE HESPERIDES," 1676 dustrious searcher and lover of all nature's rarities." He died in 1637.

His son inherited the travelling tendency, for he visited Virginia 1637, searching for new plants. From these journeys the family brought home many curiosities, which they assembled in a museum known as Tradescant's Ark, a collection that eventually came into the hands of Elias Ashmole who bequeathed it to Oxford University, where it formed the beginning of the Ashmolean Museum. This habit of collecting curiosities was a custom of the day. A gentleman could scarcely call himself such unless he could display cabinets of rarities.

Even more important than the curiosities was the Tradescant garden at Lambeth, where were growing specimens of the plants the family had collected, among them a tulip-tree from Virginia, the American plane-tree, the walnut, the red maple and the deciduous cypress. The family garden was also known for its yellow daffodil, *Narcissus plenissimus.*

Such American plants not alone figured in the herbals but also in such well-used books as John Josselyn's "New England's Rarities Discovered," 1672 and William Hughes' "The American Physitian," published in the same year. The former is concerned with New England plants and the ways in which the Indians used them, the latter with West Indian.

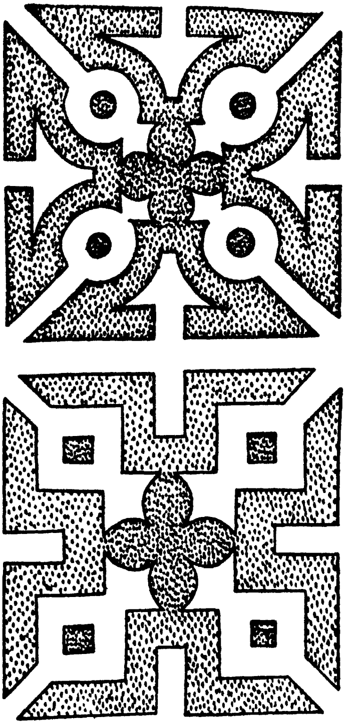
Physic Gardens and Botanists

The first private botanic collection of this kind was begun in England by Edward, Lord Zouche, at Hackney, of which L'Obel was the guiding spirit. Then in the reign of Charles I—in 1621—the Earl of Danby donated to Oxford a plot of five acres on the river Cherwell near Magdalen College, for the express purpose of planting a physic garden. He raised the ground and surrounded it with a wall through which gates designed by Nicholas Stone, master mason to the king, gave entrance. From Germany came the first head gardener, Jacob Bobart. His son, who bore his father's name, succeeded him. At the end of the first sixteen years the garden's catalogue showed sixteen hundred species and varieties being grown, of which six hundred have been identified as native plants. In 1670 there was added to this garden a slate-roofed greenhouse, which was heated in a primitive style by fire baskets burning charcoal that were wheeled around by gardeners! It later also had another claim to fame—the first wooden greenhouse was erected here in 1734.

Forty-one years after the founding of that physic garden, another was begun at Chelsea, then a suburb of London. In 1617 the Society of Apothecaries had been formed. First it leased land at Westminster, then, in 1673, at Chelsea. In 1722 the institution was made permanent when Sir Hans Sloane, acquiring the land on which the garden stood and land adjacent to it, gave it to the Company.

Sir Hans Sloane (1660–1753) had long since made a name for himself in botany. At twenty-seven he had lived in Jamaica and gathered some eight hundred specimens there. His stated purpose in giving the land to the Apothecary Society was to encourage the science of botany and not to restrict it merely to medicinal herbs. To this end he made his gift on the condition that each year the garden should deliver to the Royal Society fifty specimens of plants, properly preserved and labelled, until two thousand were given. This garden was also renowned for its greenhouse, which Pepys describes as having "subterranean heat conveyed by a stove under the conservatory"—quite an improvement over the fire baskets of Oxford.

Whereas the herbals of Gerard and Parkinson, although good reading, were scarcely scientific in their grouping of plants, by the end of the 17th century a system of classification appeared which grouped plants according to a similarity in fruit and flower. This made it possible to classify the new plants that were coming in from foreign countries, and it also served as a basis for the refinements and improvements in subsequent botanical writings. The two scientists concerned with this improvement were John Ray (1627–1701) and Robert Morrison (1620–1683).



DESIGNS FOR KNOT GARDENS, FROM "THE ENGLISH GARDENER," 1688

In Italy, a century before, Cæsalpinus had groped toward a system. Now Ray began laying the basis for the Natural System of plant classification in his "Methodus Plantarum," 1682, and his "Synopsis," 1690, the latter work being considered the first systematic British flora. John Ray was a graduate of Trinity College, Cambridge, where in the encyclopædic manner of the times, he later lectured on Greek, mathematics and Latin. A bout of illness led him from his books to the country-side. He made his first botanical tour through England and Wales in 1658. Two years later he produced a catalogue of the plants growing around Cambridge. At the same time he took Orders. Then followed other tours, on some of which he was companioned by his pupil and fellow worker, Francis Willoughby, whose flair was for animals.

Morrison also had a checkered career. Born a Scot and by belief a Loyalist, he fled to France when Cromwell came to power. There he settled at Angers, where he studied medicine. For a while he was physician and director of the gardens at Blois. On his return to England at the Restoration, he was given the task of laying out St. James's Park, and Charles II made him Royal Physician and Botanist, and later conferred on him the honour of being the first Professor of Botany at Oxford. Morrison contributed three works—"Praeludia Botanica," 1669, "Plantarum Umbelliferum," 1672 and a "History of Plants," 1680. In his "Praeludia Botanica" he devised a new system of plant classification that relied on flowers and fruits.

The Commonwealth and Practical Gardening

It would be interesting, were there time and space, to trace the effect of political and religious upheavals on the world's gardening. They have been many. Here at least one lies ready to hand. Throughout the reign of Charles I and right up to the brink of the Commonwealth, pleasure gardens were increasing in number and size. Once Cromwell was in the saddle, luxury gardening diminished and economic gardening increased. What Russia under the Soviets is doing today in agriculture, England did under the Commonwealth. Farms were enlarged and many more opened to the plough. Better farming methods were studied and introduced by the aristocracy and gentry. A greater interest was shown in fruit and economic plants. In this respect England was far ahead of France, where an ignorant peasantry and indifferent upper classes allowed agriculture to continue in a poor way for three centuries. Not until 1750 did France awake to the necessity of improving the land and building up the small country place and its owner.

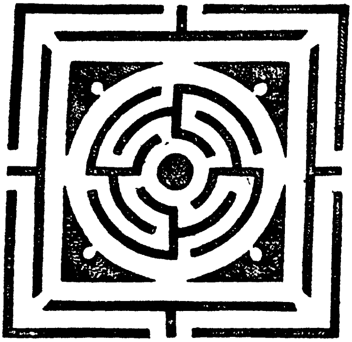
With this stimulated agriculture appeared better farm houses. The manor house became the centre of country living. Many were built or taken by Royalists who retired to the country from the "ill face of things at home" until happier days should come again. Meantime they improved their soil and crops. Not many gardens were made at this time, and some of the most famous—Nonsuch and Wimbledon among them—were sold. Theobalds was destroyed.

This practical urge also let loose a freshet of gardening books—Hartlib's "Legacy of Husbandry" and his description of farming in Brabant and Flanders; Walter Blith's "The English Improver or a New Survey of Husbandry"; Gabriel Platt's "The Country Farm"; Ralph Austen's "A Treatise of Fruit Trees" and "The Spiritual Use of An Orchard or Garden of Fruit Trees"; various books on fruit culture by John Beale; and Robert Sharrock's "History of the Propagation and Improvement of Vegetables."

These country-side improvements eventually brought about a healthy competition between farmers and gardeners. We note that in the year 1660 the first fruit and flower show to be held—the forerunner of those we enjoy today—was opened at Norwich, a town which, as Evelyn says, "was very much addicted to the flowery parts."

The Commonwealth also saw three other books appear, each worthy of note because each represents a gardening tendency. These were Nicholas Culpepper's "The English Physician," 1652; William Coles' "The Art of Simpling," 1656; and in 1658 John Evelyn's first work, a translation, "The French Gardener."

Few books written in English touching on the world of green growing things have enjoyed so many editions as Culpepper's; edition after edition came from the press, in fact, within the past few years it has again been revived and reprinted, and London now has its Culpepper Society and Culpepper shops where medicinal herbs are sold. Half-quack and half-botanist, Culpepper held to the Doctrine of Signatures, an ancient belief that plants showed by their form or markings or manner of growth the diseases they were ordained to cure. England went herb-gathering all over her woods and meadows. Whereas before this time the herb garden was a domestic spot in which certain traditional plants were grown, the entire English country-side now contributed to the making of specifics.



A LABYRINTH FOR A WILDERNESS GARDEN

Coles' book is somewhat akin to Culpepper's in that it professes to be "An Introduction to the Knowledge and Gathering of Plants," and most of these plants were to be gathered under phases of the moon and were to be made into simples or household remedies and cosmetics.

At this time every country house of any pretensions had its still-room where the housewife prepared her pomades, distilled her aromatic waters and concocted her home medicines. Here she kept her recipe book, a household treasure that was handed down from mother to daughter and enriched with each passing generation. Some of this interest in cosmetics came from France. It was in that country that lavender water—soon to become a favourite English household product—was first made.

These subjects had been touched on by Parkinson and other herbalists; in Coles' book the prescriptions were concentrated in one charming volume.

With the Restoration, cosmetics came into great favour again, and Evelyn could record in his diary: "I now observed how the women began to paint themselves, formerly a most ignoble thing and used only by prostitutes."

Long before this, of course, flowers had assumed a sanitary and prophylactic importance in English domestic and public life. House floors and church pews were strewn with sweet-smelling herbs. Stuart England reveled in perfumed baths. To protect themselves from the effluvium of jail fever, the judges in the Old Bailey carried nosegays into court, pressed to their nostrils, and doctors at sick beds sniffed at the heads of their canes, which were hollow, perforated, and filled with dried herbs.

John Evelyn's contribution to the practical gardening of the time was his translation of Jean De La Quintinye, the French vegetable expert. Like many other Royalists, Evelyn had settled on his country place and gone into gardening seriously. This book, being a compendium of all the practical information a man would need, won immediate recognition.

Restoration Gardens and After

With the Restoration that brought Charles II back from France, the making of pleasure gardens began again, and the French influence was more pronounced than ever. At the same time the manor house garden, now an established institution for those who enjoyed "rural elegancies," increased in size and number. Nor did the farmers cease their efforts to better the land and crops.

For a glimpse of gardens in those days we turn to John Rea's

"Flora, Ceres and Pomona," in 1676. Rea was a Worcestershire nurseryman. The garden he suggested would be flat. The nobleman, he said, should give eighty square yards to fruit and thirty square yards to flowers. The average gentleman could be content with forty square yards of orchard and twenty of flowers. This was a great lessening from Bacon's thirty acres and knots that sprawled over a hundred square feet each. Gardening was becoming more democratic. These gardens might have, as Rea suggests, a nine-foot surrounding brick wall and a five-foot wall dividing the sheep of the fruit from the goats of the flowers, yet here were gardens of a size more people could afford. Rea's flowers which he advised growing in raised beds to assure drainage, included anemones, carnations, crown imperials, daffodils, iris, lilies, polyanthus, roses and tulips. Of tulips he was especially fond, and this affection he must have instilled in his family, for in 1683 his son-in-law, Samuel Gilbert, wrote "The Florist's Vade Mecum," in which he suggested special designs for tulip gardens.

Though square and oblong gardens were still favoured, we find a few writers suggesting the circular garden. However, in the main the design in Stuart times was four squares within a square. This age also saw refinements in statuary, in seats and garden niches cut in the hedges, and fountains being given elaborate designs. Flower pots too, were subject to enrichment. Painted blue and white, they were set along the paths or around fountains. Sun-dials were favourite garden devices, some of them being made of clipped box, but more important than any of these was England's contribution of the clipped and rolled lawn. By 1663 John Rea was giving directions for making and maintaining such lawns as ever since have made English gardens the envy of the world. The old camomile lawn, for long a feature, was gradually supplanted by a lawn of grass.

In addition to the orangery, which increased in size and elaborateness in this era, the summer-house received the attention of skilled designers. Inigo Jones and Sir Christopher Wren both made drawings for them. John Rea suggests for the centre of a garden "a handsome Octangular Somerhouse roofed every way" and painted inside with landscapes and furnished with a table and seats.

To name all the gardening books that flooded England between the Restoration and the enthronement of William and Mary would be tiresome to the flesh and only add confusion. We can pick out three figures, however, who are typical of the times —John Rose, Sir William Temple and John Evelyn—whose lives spanned this period.

Two Gardeners and Two Gentlemen

In this era a gardener was scarcely considered well trained unless he knew French gardens and gardening methods intimately. So strong was this Gallic influence that Charles II invited Le Nôtre to England, and, while he probably never came over, it is understood that he worked on plans for the improvement of St. James's Park, Hampton Court and Whitehall. De La Quintinye did visit England, and English gardeners were sent to France. Tradescant many years back had been the first. The great figure in this generation was John Rose, gardener to the Earl of Essex, who dispatched Rose to Versailles to study. It was probably a sorry day when he thought of this, because, when Rose returned, full of French ideas, he was forthwith appointed Royal Gardener to Charles II and, finally going off for himself, became the leading practical gardener of his day. Rose was especially successful in raising fruit under glass—he was among the first to raise a pineapple—and a great believer in the vine for England. He offered to sell cuttings to all and sundry at a reasonable price and, to define his views, he wrote, "The English Vineyard Vindicated." In addition to standing as an example of a French-trained gardener, Rose was the first of a succession of practical horticultural technicians that was to reach its peak the following century in those two great nurserymen and horticulturists, London and Wise.

This custom of sending one's gardener to another country to study and the business of importing trained gardeners has now become a commonplace. What would American and Continental gardens be without their trained men from Kew and English and Scottish estates? The demand for them still exceeds the supply.

Another garden author of this era who actually laboured in the soil was Leonard Meager. In 1670 he published "The English Gardener," and, twenty-seven years later, a more ambitious work, "The New Art of Gardening." He knew whereof he wrote, for he was above thirty years a practitioner in the art of gardening, being gardener to Philip Hoffman, of Warworth, Northampton, and the latter book is dedicated to him. In these, Meager set out the plans for many small gardens and listed the flowers to deck them. His books were sane and practical, or, as he put it, "without any deceitful Dress and unnecessary Flourishes."

At the opposite end of the social pole from Rose and Meager stood Sir William Temple (1628–1698). Having served his sovereign well in foreign affairs for many years, he retired to his gardens where he devoted the remainder of his days to a leisurely and scholarly life amid his books and plants. An Epicurean, he so loved his garden that his will directed that, while his ashes were to rest in Westminster Abbey, his heart should be removed and buried near the sun-dial in the garden at More Park. In those years he had for secretary none other than Jonathan Swift, and quite an amusing picture we have of that young Irishman walking around the garden with King William and being taught by the king how to cut asparagus in the Dutch manner.

Sir William left the world his debtor by writing "Upon the Gardens of Epicurus; or Of Gardening in the Year 1685." One of

SPARSE PLANTING, ILLUSTRATED FROM THE "GARDENER'S LABYRINTH"

his hobbies was fruit. John Evelyn tells of his gardens and orangery and was especially impressed by the wall fruits "most exquisitely nail'd and train'd." It is with fruit that the book concerns itself after a historical introduction, fruit and gardening forms and garden philosophy. As an early example of the English country-gentleman, content with improving his acres, Sir William Temple stands supreme.

Cast in almost the same mould was John Evelyn (1620–1706). Like a great many other young men of the time, he took the Grand Tour, visiting France, Italy and Flanders; but, instead of wasting his substance, he began writing the diary that was to be his companion for the next sixty-six years, many pages of it being devoted to descriptions of gardens. Among the gardens he describes as having visited in 1642 was that of the Count de Liancourt: "Towards his study and bedchamber joynes a little garden, which, tho' very narrow, by the addition of a well-painted perspective is, to appearance, greatly enlarged." He also in the garden at Rueil saw an arch of Constantine painted on a garden wall and so skilfully that "one may mistake it for stone and sculpture." Let's see—we encountered these perspective mural gardens first in Pompeii! Then Erasmus described them—galleries with floors painted green for grass and the walls representing woods—just as some of the Egyptian tombs were decorated. Surely there is nothing new in gardens.

Home once again, he cast about how he should employ, to the best advantage, the time which hangs on most young men's hands. In 1652 he settled at Sayes Court, his place at Deptford and began improving it, planting that famous holly hedge four hundred feet long, nine high and five thick that Peter the Great just about ruined, when he occupied the place, by ruthlessly trundling a wheelbarrow over it. While near London Evelyn played his part in public affairs, but, yet finding time on his hands, he set to planting trees. He had already translated De La Quintinye's book. Now the interest in trees set him to writing "Sylva," a practical work which, as he says himself, "has been the occasion of propagating many millions of useful timber trees thro'out the nation . . ." and "incited a world of planters to repair their broken estates and woodes which the greedy Rebells had wasted and made such havock of." This style for being interested in planting and improving trees which Evelyn set continues down to our own days both among English gentlemen and men of affairs in many another land.

Not alone did he improve his own garden, but he went about helping other estate owners to improve theirs, and he carried on a vast horticultural correspondence ranging from the tenderness and hardiness of plants, by which method he classified them, to the insulation of conservatories. His diary and letters are a mine of information on contemporary gardens.

In 1664 he published his "Kalendarium Hortense," or gardener's almanac. The idea for such a calendar originated with Lord Bacon in the previous century. Bacon had said: "I hold it in the royal ordering of gardens, there ought to be a garden for all months in the year, in which severally things of beauty may be then in season." And he specified the flowers for each month. Evelyn improved on this by adding the garden work for each month. He wrote it in a time when, as he said, "Horticulture was not much advanced in England." Before this, in 1653, Sir Thomas Hammer set down the year's work in his manuscript of gardening directions. This was not discovered and published until 1933. The father of all these gardening calendars was Palladius Rutilius of the 5th century, for in his "De Re Rustica" he devoted twelve books to the agricultural work of the succeeding months. The popularity of Evelyn's calendar leads us to suspect that it had much to do with the advancement of horticulture that started in Evelyn's time. The style of the "Kalendarium Hortense" is copied even to this day in gardening books and magazines. To Abraham Cowley he dedicated it, and Cowley, in turn, dedicated his essay and poem, "The Garden" to Evelyn.

Evelyn handed on his love for planting and gardens to his son, as is proved by the son's translation of René Rapin's poem, "Hortorum," which was included in one of the editions of "Sylva."

Naturally a man of Evelyn's parts and public activities gathered about him many friends. He it was who discovered Grinling

Gibbons, a poor wood carver, whom he made one of the first artists of his and all time. He was interested in all manner of things—painting, vases, silk stocking weaving machinery, a diving bell, musical instruments, glass works, paper mills, fireworks and even rattlesnakes—but his garden and gardening friends came first. Among them was Elias Ashmole, who inherited Tradescant's Ark, and Sir Thomas Browne, author of "The Garden of Cyrus," a quaint work on the quincunical plantations of the ancients, on flowers in the Scriptures, on grafting and plants to grow from which to weave garlands.

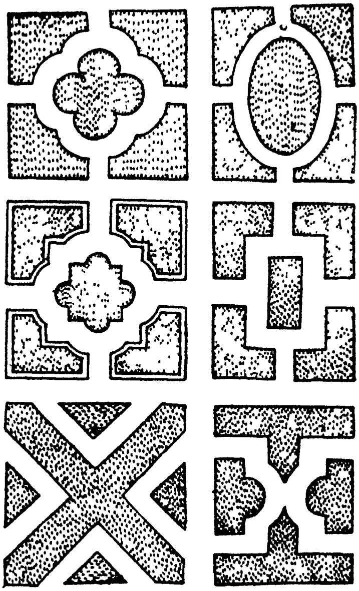
The influence of John Evelyn in English gardening is still discernible. To his memory we raise our hats. He was, as Pepys says, "a very fine gentleman."

Seventeenth Century Colonial Gardens in America

In addition to England itself, other parts were experiencing the garden urge—Ireland, Scotland and America especially.

Ireland had its first established formal gardens about this time and her nurserymen soon excelled in growing fruits and vegetables under glass. In Scotland, as we have seen, the Quaker gardener, John Reid, had written the first gardening book for his section, which aroused the gentry to take an interest in their places. When times grew hard at home, Scotch lads went to England in search of work, and it was not long before Philip Miller, at the Chelsea Physic Garden, was acknowledging that almost all the gardeners of South Britain were natives of Scotland.

The story of the beginning of gardens in America is a much more extensive narrative. Although both the Pilgrims going to Massachusetts and the early settlers to Virginia carried with them precious seeds and roots from the Old Country, the pleasure garden could scarcely be expected to take form until the settlements were assured of food crops, their houses substantially built and a degree of leisure attained. In fact, our first evidence of a pleasure garden was not English, but French, and is contained in a map Champlain drew in 1604 of the short-lived settlement on what is now Neutral Island in the St. Croix River between Main and New Brunswick. Two gardens are indicated, little patterned gardens in the French style of the 16th century. The first record we have of Indian gardens on the Atlantic seaboard is found in the report Sir Francis Drake made of a retaliatory attack on Indian villages in Florida in 1583, when he "burned their buildings and destroyed their gardens." These were probably merely corn and bean patches and peach-tree groves, for the Indian was not given to gardening finely: indeed, agriculture came second to the chase, trapping and fishing, and was the responsibility of the squaws in most tribes.



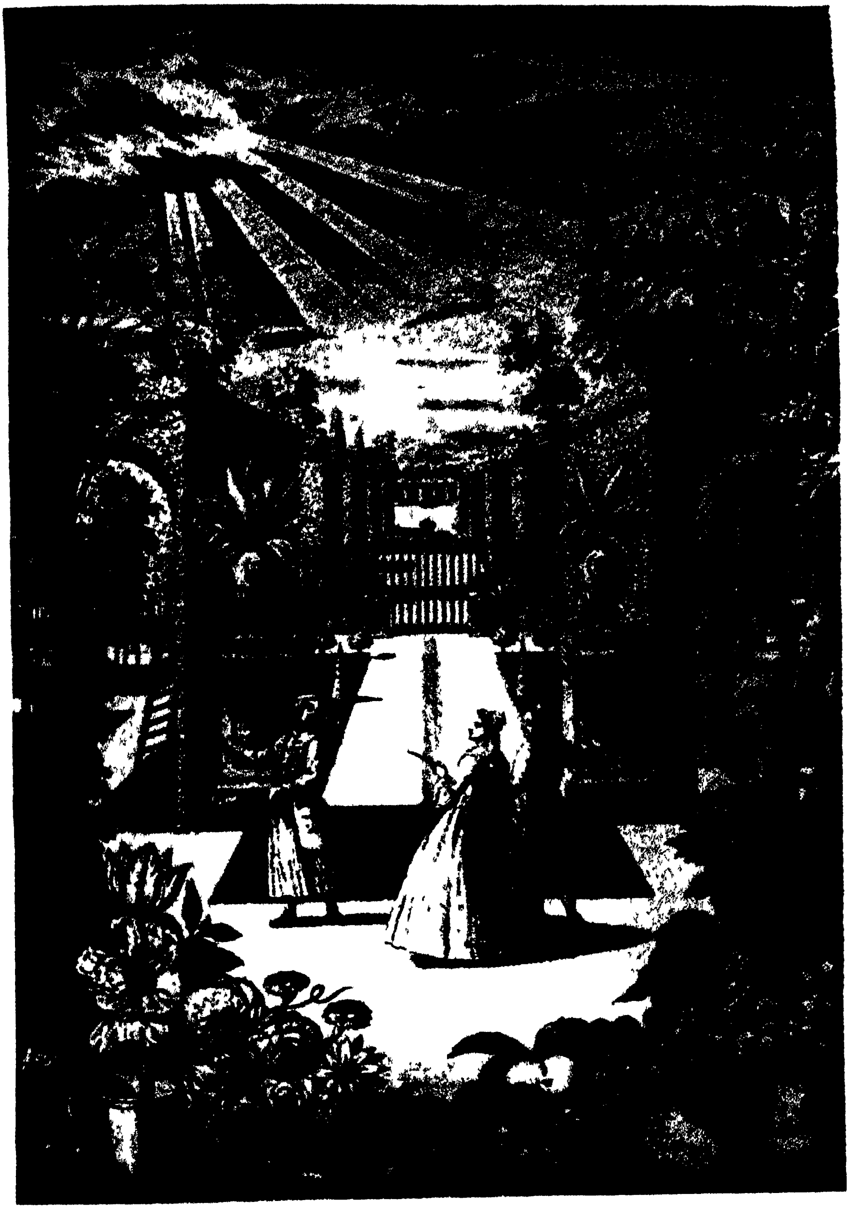
TUDOR GARDEN DESIGNS TO BE WORKED OUT WITH SANDS AND LOW FLOWERS

In the forested regions Indians girdled trees with stone hatchets and then brought the dry, dead timber down with fire. The grounds were worked over with wooden mattocks. The crops planted in these clearings appear to have been limited to two kinds of maize—white dent and white flint—beans, pumpkins, squash, groundnut, Jerusalem artichoke, wild onions, tobacco for smoking, gourds from which to make vessels, and sunflowers which they chewed and from which they extracted an oil. They also collected and used many other wild plants for food, basket-making, drinks, ropes, dyes and sugar. From Virginia south they probably had the potato. The northern Indians cherished the small black plum, from which they made prunes, and in the south the Creeks, Cherokees and Choctaws grew the peach and distributed the kernels of it as far north as Rhode Island.

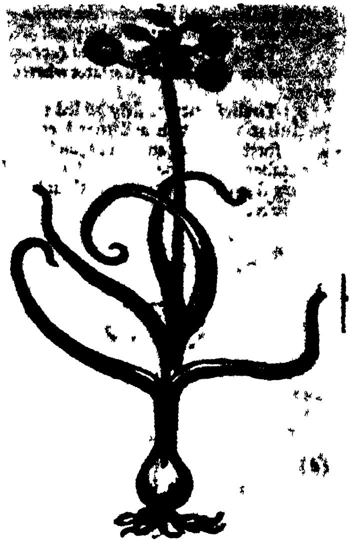
As they lacked beasts of burden, save dogs and wives, their farming was crude and slovenly and yet quite productive. They planted corn in rows of hills about three feet apart. Beans were also dropped in the same hole and the vines trained up the corn. Between the hills they planted pumpkins and squash. The latter the English called vine-apple. Squaws and children weeded and cultivated these patches, and the children were assigned the special job of scaring off the crows that pulled up the corn. The women also harvested and stored the fruits of their labours, together with salt meats, in deep caves. Here they hid their charred corn and beans and dried berries for winter consumption.

The Iroquois in New York kept a Corn Festival, a thanksgiving period that lasted four days, during which the Red Men gorged themselves on succotash. If they had taught the new settlers nothing more, they would amply have justified their existence by handing on this succulent mixture of corn and beans. They also traded in their crops, both with other tribes and with settlers, and on more than one occasion they kept the latter from starvation. Certain Indian methods of agriculture were adopted by these settlers. The Indian made still another valuable contribution—his manual labour. The first "hired man" in America was an Indian.

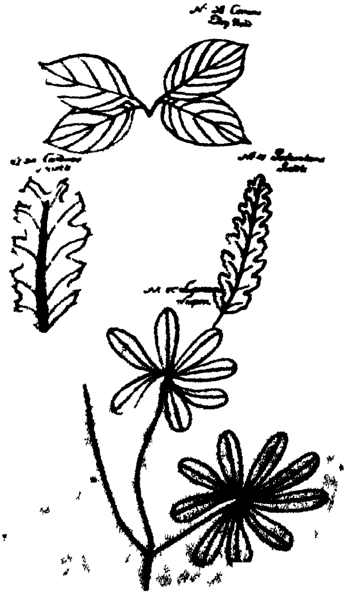
The first nurseryman was Governor Endecott of Salem, and



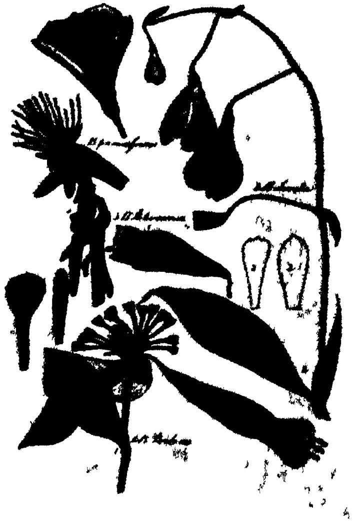
IN THE "CATALOGUS PLANTARUM" IS PICTURED AN IDEAL PLEACHED ALLEY IN AN 18TH CENTURY ENGLISH GARDEN



GERARD'S "HERBAL" OF 1636



JANE COLDEN'S NEW YORK FLORA OF 1743



HERBERT'S "AMARYLLIDACEAE" OF 1837

with him we can start down the coast indicating a few trends of gardening evident up to 1700. Orchards figured in the earliest New England wills, and by 1641 Endecott traded five hundred three-year apple-trees for two hundred and fifty acres of land. By 1646 gardens had become so necessary a part of the colonist's existence that Massachusetts passed laws for the punishment of those robbing orchards and gardens; doubtless the first American legislation to protect horticulture.

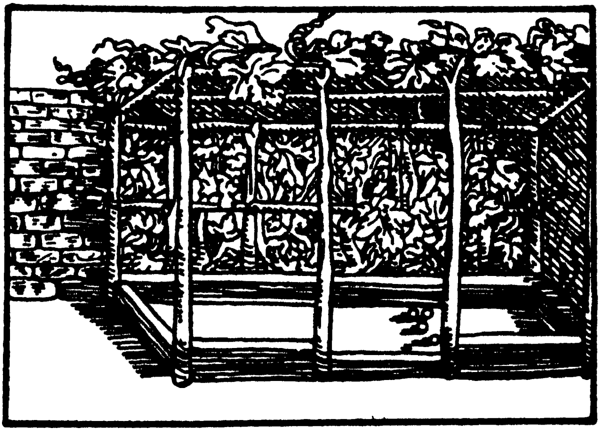
Our sources of knowledge on these beginning gardens and the plants the settlers found and brought with them, are several volumes. There are John Josselyn's "New England's Rarities," 1672, and his "An Account of Two Voyages to New England," 1674. Josselyn was in New England in 1663 and again from 1683 to 1689. He lived for eight years in Boston, and he lists the plants growing there in gardens and available for gardens. Other New England sources are William Wood's "New England's Prospect," 1634, and Captain John Underhill's "News From New England," 1638. For the other early colony we turn to Thomas Hariot's "Brief and True Report of the New Found Land of Virginia," 1590, and the Rev. John Bannister's "A Catalogue of Plants Observed in Virginia," 1680. Much earlier French works contained references to American plants—Cornut's "Canadensium Plantarum," 1635, describes some forty; René Morin's catalogue of 1621 and the 1626 and 1636 catalogues of the Jardin du Roi. Parkinson's "Paradisus" had its quota by 1629. The correspondence of settlers and the transactions of the various trading companies help patch out the picture.

It was natural that the English settlers, when they came to make gardens, should pattern them on the kinds they had known at home. In the main, the first settlers of New England sprang from the middle class, so that not until several generations pass *do we find them aspiring to large or elaborate gardens. Flower and ornamental gardens—usually doorways ornamented with flowers and shrubs—did not appear in Boston until the first half of the 18th century. Such gardening books as they brought along were English of the period.*

One of the first shipments of the Massachusetts Company to New England included grape-vines for making wine, some fruit, wheat, rye, potatoes, barley, oats, saffron, hops and currants. Josselyn attests: "Our fruit trees prosper abundantly, apple trees, pear trees, plum trees, barberry trees, the country is well replenished with fair and large orchards." The English brought in the quince. In gardens he notices houseleeks, single and double hollyhocks, honesty, lavender cotton, marigolds, pinks, sweet-brier roses, three kinds of violets, patience and "English roses very pleasantly." One Salem garden of 1620 is described as having parsley, sweet chervil, sorrel and other pot herbs on one side the path and, on the other, sage, thyme, spearmint, mullein, fennel and other medicinal herbs. William Wood states that "in planted gardens are sweet marjoram, sorrel, perennial yarrow, hempe, and flaxe, besides turnips, parsnips, carrots, radishes, musk mellions, cucumbers, onyons." He also said that cherries grew wild in the clearings. Down in Connecticut, by 1637, the General Court of Hartford was ordering every family to provide and plant at least one spoonful of English hemp seed. Thus the home garden provided both pot and medicinal herbs, some vegetables and a few economic plants.

In "Gardens of Colony and State," the following are listed as growing in gardens previous to 1700: Flowers—anemones, carnations and clove pinks, columbine, crown imperial, daffodils, stocks, grape hyacinths, hollyhocks, houseleeks, marigolds, Martagon lilies, honesty, primroses, single and double roses, scarlet cross, sedums, Star of Bethlehem, tulips, violets and yellow day lilies; herbs—balm, belury, chives, clary, five finger, hyssop, lovage, mint, mustard, pepper grass, sage, sweet marjoram, summer savory, tarragon, thyme and wormwood; shrubs—flowering peach, privet, white thorn and flowering currant.

Seeds and roots soon came in thick and fast. Imported hayseed gave Rhode Island the best hay in New England. Beet seeds, horseradish roots and walnuts were imported. Besides these the settlers were bringing in from meadow and forest wild plants that throve in cultivated soil. Around their farms and gardens early settlers built fences and piled walls from stones picked up in clearing the land; and, in regions where stone was scarce, they surrounded their gardens with ditches and hedges to keep out straying cattle. In this farm and garden work the Indian was first hired to assist, and later indentured servants worked out their passage by labouring on farms and in gardens.



A BOWLING ARBOUR, FROM THE "GARDENER'S LABYRINTH"

Of the earliest gardens the Dutch made in New Amsterdam and its environs, we have read in Chapter X. Apart from the few examples noted there, luxury gardens did not appear until the English took over the colony in 1674. Between that date and 1700 rapid advancement was made. The great manors were granted and cultivation of them begun. Huguenots settled in Long Island and in New York and pursued fruit culture successfully. By 1700 Long Island was already famous for its fruit trees, and the farmers had formed a co-operative association. In New York itself, the West India Company planted a garden on the site of what is now Trinity Church.

In lower New Jersey and on the banks of the Delaware, the Swedes had set out orchards of apples, cherries and peaches, that proved an excellent heritage when the English took over that section in 1665.

In Pennsylvania we find the first pre-conceived garden schemes. William Penn directed the commissioners who settled the colony in 1682 to see that every house "be placed, if the Person pleases, in ye middle of its place as to the breadth way of it, so that there may be grounds on each side, for Gardens, or Orchards, or fields, yt it may be a greene Country Towne, wch will never be burnt and will allways be wholesome."

Five public squares were laid out within the town's limits and in the centre was a square of ten acres. These squares corresponded to the commons in New England villages and were the progenitors of the American park system. From the very beginning Philadelphia named its streets from forest trees plentiful in those neighbourhoods; by 1750 it began to set out trees along the streets, the first American record of street tree planting.

The same sort of scheme was followed when Oglethorpe laid out Savannah in the next century, so that, in a sense, these towns with commons and open squares were the ancestors of those "garden cities" which have become so popular and wholesome a style of town planning in our own generation.

Penn also wrote of the fertile soil and the serene air that was "sweet from the Cedar, Pine and Sarsefrax with a wild mertike which all send forth a most fragrant smell, which every breeze carrys with it to ye Inhabitants when it goes." The native flora was abundant, and what it lacked was brought from England. An early correspondent states: "Our gardens supply us with all sorts of herbs and even some which are not in England. Here are roses, currants, gooseberries, turnips, while carrots and onions are better than those in England." He also mentions three varieties of peaches.

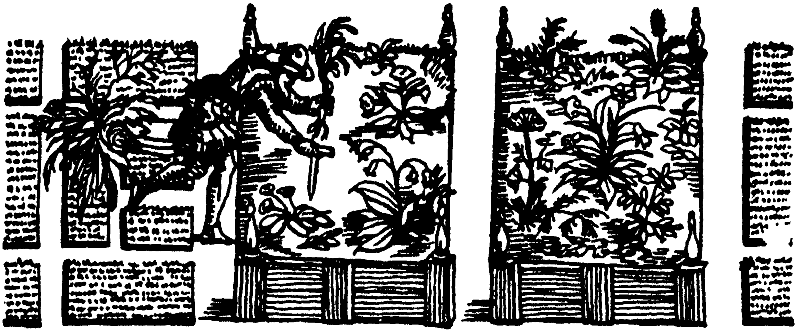
From the very beginning William Penn was garden-minded, both in respect to his fellow settlers and to the development of his own place, Pennsbury Manor, an estate of 6558 acres he purchased on the Schuylkill River. Here he started a mansion for himself, and, when obliged to be in England for extended periods, kept up a detailed correspondence about the planting and the building of roads. He had great faith in the country as a place to raise wine grapes, and sent vines from France for this purpose. However, in this he failed. When his gardener, Ralph, died, he sent over another trained man from England, and seeds and slips went by every boat. Much plant material was brought in from the near by forests and meadows. Eventually Penn employed five gardeners on his place. He moved into the house, which had been built of materials brought from England, in the spring of 1701. Alas, like many a gardening husband before him and since, he was unable to convince his wife of the benefits and enjoyment of country living. Staying out there in the wilderness irked her, nor was she so anxious as he to have the children become husbandmen and housewives. Though he dearly loved Pennsbury Manor, it came to be a great expense and disillusion to him. Today no remains of the house can be found and only a few straggling trees bear witness of that garden and orchard which, in 1704, had been the boast of the colony.

Two other figures rose to prominence in Pennsylvania before the 18th century—Francis Daniel Pastorius and James Logan. The former came to Pennsylvania in 1683 with the first German emigrants, and two years later selected a tract beyond Philadelphia where he settled forty-one High Germans. To each house he allotted three acres. Pastorius was a botanist of no mean note, and his observations on the flora springing from the black, fertile soil of Germantown, as he called the settlement, were thorough and deeply appreciative. In fact, all the Germans who came to Pennsylvania proved good tillers of the soil. The first garden in America to attempt a botanical arrangement of plants was set out in 1694 by the German Pietists under Kelpius on the lower Wissahickon near Philadelphia.

James Logan came with Penn when he returned to Philadelphia in 1699. He served the colony in several important capacities and became one of its first citizens. A botanist of keen observation, he studied the sex of plants by experiments on Indian corn, and in 1739 produced a Latin essay, published in Leyden, "Experimenta et Meletemata de Plantarum," which was based on the Linnæan system and Camerarius' segregation of plant sexes. In 1747 this was translated into English by Dr. Fotergill. Logan's country place, Stenton, located four miles north of Philadelphia, became famous for its gardens, the grand avenue of hemlocks being especially notable. The house, built in 1731, is still preserved and some of the garden has been restored.

Another fact before we leave Pennsylvania—on March 23rd, 1699, near the little town of Darby, a lad was born, to whom his parents gave the name of John Bartram. We shall be hearing more of him later on.

To the settlements of Maryland and Virginia came a different class of people from those who arrived in New England, and they found climatic conditions that were more favourable for garden making on an ambitious scale. Wheat was sown within two weeks of the arrival of the colonists at Jamestown, and an early journal records, "a garden was laid off and the seeds of fruit and vegetables not indigenous to the country" were sown.



RAISED BEDS, AS SHOWN IN THE "GARDENER'S LABYRINTH"

The Southern colonists of the 17th century took up extensive grants of land that they farmed, planting tobacco especially, and it is a credit to their labours and tillage that by 1689 the annual export exceeded 15,000,000 pounds. On these plantations they eventually built homes of distinction, where they lived luxuriously, and laid out noble gardens around them. Some of these early places remain to this day, estates whose names are saturated with romance—Claremont Manor, Tedington, Brandon, Flower de Hundred, Westover, Shirley, Mt. Airy, Lawrence Hall, Poplar

Hall, Toddsbury, Stratford Hall, Rock Castle and such. Trees around the houses on many of these places are so ancient that there is no doubt the 17th century owners planted them.

To these estates they brought many new plants from their travels abroad. Thus, in 1684, William Byrd of Westover, to cite one instance, reports in a letter the safe arrival of currant and gooseberry bushes, and tells how the seed sent him from England had flowered, and mentions his anemones, crocus, iris, roses and tulips. Within a few years they were making stately gardens with boxwood, noble patterned gardens that reflected their acquaintance with the stately gardens of the Mother Country.

Soon Virginia spilled over into Carolina, and by 1670 Charleston on the Ashley River was founded. In the country-side around it lay vast rice plantations and on these also sprang up noble homes and gardens. As they belong to the 18th century, the story of these gardens and those of Georgia will follow later. Passing to Florida, Menendez had St. Augustine safely settled by 1685 and the Spanish missionary outposts were scattered up and down. the coast, each of them a local centre of herb and fruit cultivation.

The first French gardening penetration of North America came, not through the Mississippi Delta, but through Canada. The 18th century was well into its second decade before Mobile and New Orleans were settled. Twenty years previous to this, Fort Pontchartrain lifted its stockades where Detroit stands today, and by 1701 the first settlers were harvesting their wheat crops. Gardens sprang up around the fort. When Cadillac came down from Quebec he brought a gardener along with him—Pierre d'Argenteuil, who helped lay out plots and encouraged his fellow townsmen to plant orchards and fill their gardens with flowers and shadow their doorways with vines.

These crude Middle West gardens were being fashioned at about the time Louis XIV, glancing out of the windows of Versailles to his own gardens, could think tenderly of the splendid man and great artist, just deceased, who so nobly planned and executed them—André Le Nôtre.

CHAPTER XII

LE NÔTRE AND THE SPREAD OF HIS GARDENS

JUST as some plants bloom most gorgeously when the end of their life-cycle approaches and thereafter spend their energies casting seed that their kind may be reproduced, so did the ultimate flowering of the Renaissance attain astonishing brilliance in the garden of André Le Nôtre and the planting of his influence throughout the Continent.

Le Nôtre's life unrolls a rare human document.

He was born at Paris in 1613. His grandfather was a royal gardener, and his father, Jean Le Nôtre, was superintendent of the Tuileries gardens and also worked at Saint Germain. The family was allied to that of the poet Corneille. The Le Nôtres lived in the Tuileries, along with many other artists and artisans who worked for the Court. At André's baptism, the wife of Claude Mollet stood as his godmother. When his son reached thirteen, Jean Le Nôtre made an effort to give him a gentleman's education—sent him to study under Simon Vouet, a decorator-painter, who worked on the walls of many fine houses. Other boys were in Vouet's class—Mignard and Lesueur, and the most promising among them was a lad by the name of Charles Le Brun.

Vouet had an Italian wife, and he had travelled in Italy and even as far east as Constantinople. His portfolios contained drawings of Italian gardens and views of Greek remains. Le Nôtre undoubtedly studied them, for he appears to have been fascinated by the Boboli gardens at Florence. It is also believed that he studied architecture for a time and that, as a young man, he visited Italy.

From 1626 to 1636 Le Nôtre pursued his studies under Vouet and widened his circle of friends. He early showed a marked capacity for friendship. Quick of wit, helpful, frank, honest and always beholding life and men with the keenly appraising eye of the artist, he was surely destined for a career. When this pleasant atelier life came to an end—he was twenty now—he decided to follow the family profession. He was given a post under his father at the Tuileries gardens, with a salary of 1500 livres a year and the assurance that he would succeed him as superintendent. Six years later the Queen gave him charge of the parterre and the famous jasmine trellis and the roses, a practical gardening task. So successfully did he apply himself to these problems that he soon attracted attention. He may also have designed some of the gardens of the houses Vouet decorated.

In 1640 he married Françoise Langlois, a girl of excellent family, verging on nobility. Both through his birth and his marriage, Le Nôtre belonged to the artistic set of the time, a set that intermarried and assured one another of a share in the important work then going on. His first great opportunity came through just such a friendship.

Vaus-le-Vicomte and Chantilly

Meantime his studio companion, Le Brun, also was rising in the world. He found a patron in the king, who made him chief painter and gave him charge of all art works for palaces and royal monuments. In this capacity Le Brun dictated the taste of his time. His immediate patron was Nicholas Fouquet, Mazarin's financial minister, who had acquired a large property at Vaux-le-Vicomte, between Paris and Fontainbleau, where, about 1650, he began building, at the staggering cost of 17,000,000 livres (most of them stolen) and using sixteen thousand workmen, an elaborate moated castle designed for him by the architect Le Vau. For the landscape work Le Brun recommended his friend Le Nôtre. Thus Le Nôtre received his first big commission and found a chance to try out those principles of garden design he had been studying and evolving. In this and in all his work thereafter, Le Nôtre maintained a close association with artists. Their co-operation contributed much to his success.

He began working on the grounds of Vaux-le-Vicomte in 1656—he was forty-three—and eleven years later the work was finished. It was a difficult problem, but he solved it successfully and magnificently. He believed that the garden should be viewed as a whole from the château and he went about laying out extensive and interesting views—put in vast parterres and located fountains, built a water theatre and grottos and arranged statues and clipped trees that would serve both as a lordly setting for the structure and as a background for fêtes, then so popular with the court. It was the first example of a formal French garden laid out stiffly on geometrical lines. A severe garden in many respects, yet it displayed those principles of design that Le Nôtre had conceived as fundamental and necessary for such a site.

In this ambitious program he was assisted by Antoine Trummel, gardener-in-chief, with the flower specialist, Jacob Besseman, under him. To Claude Roubillard he assigned the task of arranging the water effects. Roubillard was no less ambitious than Le Nôtre. He tore down three villages that he might bring water to the site and then impounded it in reservoirs of marble especially imported from Italy. From the first Le Nôtre displayed vastly expensive notions, and his services obviously could be afforded only by the princely and very rich. When he turned on the fountains at Vaux, the court was breathless in its admiration. Such garden luxury had never been seen in France.

The king first saw them and the other magnificences on the occasion of a five-day fête, a sort of magnificent garden house warming, that Fouquet gave in 1659. At a glance he realized that Fouquet had surpassed the gardens of royal residences at Fontainbleau and Saint Germain. His jealousy was further quickened into action when he discovered the gross grafting of the chancellor. He ordered Fouquet arrested and jailed for life and his property confiscated. He directed much of the statuary and plant material moved to Versailles when he began working on that development. However, the extensive parterre and some other sections of the garden remain intact to this day.

Meanwhile the work he had begun for Fouquet brought Le Nôtre to the attention of the Great Condé. This warrior, having retired from public life, wanted his place at Chantilly, which had a Renaissance garden, developed and modernized. Once more Le Nôtre was careful in his choice of assisting artists. For gardener he chose La Quintiney, who was to make a name for himself. Daniel Gitard was architect. In an assisting capacity Le Nôtre (the Le Nôtres had no children, by the way) put his nephew Claude Desgots. Le Manse was selected for water engineer. The plan first turned the meandering stream of the Nossette into cascades and a broad canal that divided the parterre lying in front of the château. The Condé had invented a hydraulic machine that Le Manse cleverly used to obtain these water effects. Le Nôtre also developed a great esplanade with treillage galleries, and he cut long avenues through the forest in the goose-foot style

—several avenues radiating from a semicircle, a favourite device of the day.

In one of her letters Madame de Sévigné describes a visit to this garden on a gorgeous July day in 1677, and speaks ecstatically of the water-works, bowers, terraces, and how they were entertained at supper by the music of "six hautboys, six violins and the most melodious flutes." The French definitely made these magnificent gardens that they might entertain in them.

Versailles

Louis XIV, having watched the development of these two great gardens, was impressed by Le Nôtre's capacity for design. He had already begun work on remodelling Versailles. The first building there was a shooting box set up in a marsh by Louis XIII. Jacques Boyceau had laid out embroidered parterres around it. The previous monarch had prevailed on his nobility to stay on their own places; Louis XIV's scheme was to build up a large court. He planned at Versailles to make accommodation for it and, reversing the plan of his father, drew the nobility off the land and attracted them to Versailles.

The first step enlarged the original shooting box, a commission assigned to Fouquet's erstwhile architect Le Vau. In 1670, Le Vau having died, Jules Hardouin Mansart (nephew of François Mansart, who invented the Mansart roof) was chosen for architect. He had been successful in drawing plans for the villa Louis built for Madame de Montespan in 1665 at Clagny, a project that cost the privy purse some 17,000,000 livres. Le Nôtre had done the garden, developing bosquets, parterres and using many grass walks and much treillage, and assembling a famous collection of orange-trees for it. At Versailles, Le Brun, as comptroller of the royal art, became master of the artists. Such were the friends Le Nôtre found when the king assigned him the task of landscaping Versailles in 1662. He was almost fifty then, and for the next twenty years he can scarcely be said to have ceased working on the task.

The preliminary plans that Le Nôtre presented to the king, as they walked together over the site, were received ecstatically. He was to see nothing from his windows but that which he had created. The king wanted the garden immediately. There was to be no waiting for trees and shrubs to grow up. However, two essential items were lacking for the immediate execution of these plans—sufficient water and large trees. The story of how they were supplied is unparalleled in gardening history.

From Vaux-le-Vicomte much of the statuary and thousands of the trees were transplanted. Over the unbelievably bad roads large trees were hauled from Compiègne, Flanders, Normandy and the mountains of Dauphine. One shipment alone in 1688 was for twenty-five thousand trees purchased in Artois and costing 17,000 livres. Those that died were immediately replaced. This part of the work was carried forward under Sieur Ballon, director of trees in the parks and avenues.

An equally able engineer had charge of the water problem—Pierre de Francine. He tried tapping various water sources. One of them involved digging a canal from the River Sure, an undertaking on which thirty thousand soldiers were employed. The attempt failed after fever had taken the lives of several thousand of the soldiers. Finally a series of ponds and canals brought water from the plateau of Satory, the system that still supplies water both to the gardens and the town of Versailles. In its final development there were no less than fourteen hundred jets of water in the Versailles gardens; now only six hundred and seven remain. They were played in their entirety, of course, only on the occasion of great fêtes.

Le Nôtre began his work in orderly fashion. He turned Boyceau's parterre into a wide plateau which is now the water parterre. Next he laid out the central walk, the Allée Royale, ending in a small pond, later to become the Bassin d'Apollon. By 1665 the main lines of the garden had been established. Meantime the Francine brothers were working on the water effects and creating the grotto of Tethys, which, in 1686, was torn down to make way for the Bosquet des Domes. Here bosquets, of which Versailles had many, consisted of a grove of trees arranged in a geometrical pattern around some ornamental feature. These were often used for parties.

Le Nôtre was not blind to the fact that he was working for a *blasé* court and that he must supply novelties and surprises. This accounts for the great variety of fountains and water tricks, bosquets and grottos. On the parterre he laid down extensive water mirrors to reflect the lines of the palace, and he enriched them with playful *putti* and the four recumbent figures representing the four great rivers of France. In the Salle du Conseil was set up a water obelisk eighty feet high and nine feet wide at its base, with the pipes stepped down so that the water always appeared white. Equally impressive was the water theatre, where three cascades poured into a middle oval, and hundreds of jets, wet against slipped green backgrounds, sprayed the air. Still another was the Bosquet of the Three Fountains—three basins on three levels, the lowest octagonal, with sixteen jets of water neatly calculated to form arches.

After these were set up, work on the Grand Canal was commenced. It was planned to extend the vista and at the same time drain a marsh. As finally developed, the canal took the shape of a cross. Its main arm extended more than a mile. At the end of the north arm stood the Trianon, at the south the Menagerie. Such an expanse of water tempted the court to picturesque extravagance: fourteen gondoliers were imported from Venice to manage the boats and there was even a warship armed with thirty-two miniature guns. Often the king dined aboard his barge or on the miniature cruiser, and the canal saw many a colourful fête.

In 1669 still another water effect was begun—the Bassin du Dragon being re-arranged and at the entrance to the Allée d'Eau, with its fourteen fountains, was set the pyramid of François Girardon and Claude Perrault. Girardon was also responsible for the Bath of the Nymphs of Diana. In 1674 the Labyrinth, with its thirty-nine fountains, was made.

Year after year the work continued. At times as many as thirty-six thousand workmen were employed. Le Brun collected about him over ninety artists, who designed hosts of statues and fountain figures in lead, bronze and stone. All statues had first to be made life-size and set in place for the king's inspection and decision. From Italy were imported antique statues and copies of antiques.

In 1678 Le Nôtre trooped off to Italy for more inspiration. Pope Innocent XI had asked Louis to loan his genius so that the gardens of the Vatican might be improved. It is rather arresting to realize that Louis was only twenty-four when he first ordered Le Nôtre to take over the Versailles development; he was forty when Le Nôtre went to Italy and Le Nôtre was his senior by twenty-five years.

The king's passion for developing Versailles was insatiable. Between 1667 and 1680 the Menagerie was built and the animals —comprising the greatest private zoo in the world at the time— were assembled. In 1670 he turned his attention to the other end of the cross-arm of the Grand Canal. Here he erected for Madame de Montespan the Trianon de Porcelaine, which was decorated in the new Chinese taste fresh brought home by Eastern traders and missionaries. This was merely an elaborate tea house surrounded by detached buildings. Everything possible was executed in faïence, even some of the flowers. Michel le Bouteux, Le Nôtre's other nephew (Claude Desgots being the first) had immediate charge of the garden.

The same year that saw the first version of the Trianon begun also witnessed the building of the Orangery. Mansart designed the structure and Le Nôtre collected the plants and laid out the adjacent garden. The building, which is 506 feet long by 40 deep, he faced with a parterre that gave ample setting for sculpture by Le Gras and Le Comte. Near by he planted a labyrinth. Louis' passion for orange-trees was not satisfied until Le Nôtre had collected three thousand of them, many from Italy, some from as far away as the island of Dominica. Behind the Orangery parterre Le Nôtre took a swamp and made from it a sheet of water he called Pièce des Suisses. Not far off, in a bosquet, was the Salle du Bal, an elliptical area with a rock cascade at one end and seats for spectators on the sides, the middle lawn being reserved for the dancers. Mansart (of whose designing ability Le Nôtre held no exalted opinions) was responsible for this Salle and also for the Colonnade. The latter still exists.

To the east of the Swiss Lake was the vegetable garden presided over by Jean de La Quintinye (1626–1700), who, in the universe of fruits and vegetables, was as much a genius as Le Nôtre in the world of garden design. Born in Poictiers, he started his career by studying law, meantime designing a garden for his patron, M. Tambonneau. From this legal study he was diverted by being dispatched to Italy, along with his patron's son, to study plants. This definitely settled his career, and from then on he pursued it successfully until he reached the apex as Director of the King's Fruit and Kitchen Garden.

A large square, this utilitarian garden was divided into sixteen compartments separated by alleys of fruit walls. In the middle was a circular basin and on four sides were wide terraces containing thirty-one smaller gardens. Between 1679 and 1782 Le Quintinye was working on it, and well paid he was for the job, too—2000 livres a year and 4000 bonus. The latter was granted because he was so successful a propagator, especially of early and out-of-season fruits and vegetables. In December, for example, he would set before the king fresh asparagus; radishes, lettuce and mushrooms in January; cauliflower in March; strawberries and peas in April; and figs and melons in June. What the Court did not consume from the vast produce of this garden was distributed gratis to the town's populace.

Le Quintinye also found time to write, as we saw in the previous chapter, the best book on fruit and vegetable growing in his generation—"Traité des Jardins Fruitiers et Potagers," which was published in Amsterdam in 1690. It was translated into English first by John Evelyn under the title "The Compleat Gard'ner," and later by London and Wise. He also found time to visit England twice, where he stayed with Evelyn who, on one of these visits, had his portrait engraved.

Like his master, Le Nôtre, he always availed himself of expert assistance. He was determined to grow the best peaches in France, for example, so he went to Montreuil, where the best peaches were produced at that time, and hired the best expert on them, Nicolas Pepin. (May peach-growers hold his name in reverence!)

Le Quintinye also had charge of the *parterre fleuriste,* the picking garden, where flowers were grown in quantity for the decoration of the palace rooms. In those days the patterned gardens were not planted to flowers. Certainly at Versailles, so many and so extensive were the parterres that it would have been almost humanly impossible to keep them filled with flowers. Consequently when flowers for decoration were wanted, they were grown, as we grow them today, in the kitchen-garden.

Le Quintinye died in 1688. Consoling his widow, Louis said, "Madame, you and I have suffered a great loss that we can never repair." Today Le Quintinye's vegetable garden is occupied by a school for training gardeners and there meet the Confrères de Saint Fiacre.

Though they were constantly changed, the gardens at Versailles may be said to have been finished by 1688. The king honoured Le Nôtre with the Order of St. Michel. The old Trianon de Porcelaine was torn down and Mansart designed the present marble structure. For its ground Michel Le Bouteux imported all manner of rare plants and shrubs, and so successful was he in growing them that he became renowned. By 1700 Le Nôtre passed away in his 88th year, loved and esteemed by all. His nephew, Claude Desgots, succeeded him as comptroller of the royal buildings and gardens. The chapter of Versailles' glory was drawing to a close.

Under the Regency the Court was bored with the idea of large gardens and places. The structures were little used and no great effort was made to maintain the gardens. Statues were hauled off to the museums. Hubert Robert, as we shall see in the next chapter, attempted some restorations, but the passion that had created Versailles was gone. During the Revolution it suffered terrible depredations. Not until an American millionaire, John D. Rockefeller, came along in the past few years, can France be said to have done very much for Versailles except to keep it from tumbling to pieces. Today we see only a small part of the original gigantic development that had been the world's greatest garden of its kind.

Marly

While all this confusion of building and garden making was going on at the Grand Palace, Louis used the Trianon for a retreat; then, not finding enough privacy there, he determined to build another place where he could really enjoy country life. It was to be small and solitary. He chose a deep valley located in a park adjoining Versailles and commenced work. Ambition soon ran away with him. The gardens eventually covered three hundred acres, and the park, reserved for stag hunting, another eighteen hundred and fifty. Trees for the place were hauled all the way from Compiègne; three-fourths of them died and had to be replaced.

Le Nôtre was in Italy at the time, so to Mansart fell the commission of designing both the garden and the main structure. The king had become enthusiastic about clipped yews and statuary and insisted on overseeing every one of them in place. The main building consisted of a pleasure villa with twelve little pavilions, connected by *berceaux,* that Le Brun designed as guest houses. The work went forward from 1677 to 1684 and eventually cost 12,000,00 livres. So much for Louis' dream of simplicity and privacy!

Marly was a choice garden, to apply an old-fashioned term; its cascades and basins, its bosquets and terraces were laid out in exquisite proportion. Much more shade existed here than in Versailles. The villa and gardens were destroyed in 1793, but reminders of them now enrich the Champs Elysées—Coustou's horses. During this past year, 1933, the French government has decided to restore the grounds.

Between Le Nôtre and Mansart there was no love lost, and doubtless Marly was not to the master's taste. Indeed, Mansart was not the only designer who failed to see eye to eye with Le Nôtre. One of them was that fascinating genius Charles Dufresny (1648–1724), who apparently came by his interest in gardens naturally, as he is said to have been descended from an illegitimate son of Henry IV and the wife of a gardener. For a time he served as *valet de chambre* to Louis XIV. His plays also attracted attention, as did his theory of garden design, which was for greater openness and informality. While he did not find much opportunity to put these theories into practice, he did design and execute the gardens of Mignaux near Poissy and of L'Abbé Pajot near Vincennes and laid out his own gardens in the Faubourg St. Antoine.

Before Le Nôtre came into the picture, Dufresny made a set of plans for the development of Versailles in a naturalistic style but the king rejected them—on the grounds of expense. These plans were finally published in 1731. The chances are that Dufresny was not so good a salesman of his talents as Le Nôtre, who flattered the king both in his personal contacts and in the designs he made. Thus sugar-coated, the pill of expense was much more easily swallowed.

The other famous gardens laid out by a rival of Le Nôtre's were Lunéville and the Château de Commercy. Lunéville, one of the seats of the Duke of Lorraine, was executed between 1711 and 1718 by Yves des Hours. In 1724 Louis Gervais, who had been studying at Meudon and Vienna and was destined to design the Schönbrunn there, was put in charge of the further garden development. An outdoor theatre was made, and Emmanuel Here built a famous rock grotto nine hundred feet long with realistic water effects that depicted a mountain-side village. He also worked on the duke's place at Commercy.

Le Nôtre's Influence in France

The list of gardens laid out in France by Le Nôtre or by pupils under his supervision makes an amazing array. At Sceaux, four miles from Paris, Colbert in 1670 commissioned Le Brun and Claude Perrault to alter the buildings and Le Nôtre to do the garden. Among the features were a canal three thousand feet long, a *parterre de broiderie,* an elaborate pavilion and a water allée. The last two still remain. At Saint Germain-en-Laye, a place tinkered at by many gardeners through many generations, Le Nôtre redesigned the gardens and set out the lime-shaded promenade a mile and a half long that overlooks the Seine. At Fontainbleau he rearranged the parterres and planted bosquets. At the Tuileries he made changes in levels and remodelled the garden in many respects. At St. Cloud, where Mansart rebuilt a villa for the king, Le Nôtre made an Italian cascade and put in allées and canals. At the Château de Rambouillet, twenty miles south of Versailles, he laid out a famous rose parterre and a great canal on which court ladies used to disport in gilded barges. For the Palais de Royal he designed *parterres en broiderie* and bosquets of chestnuts and limes, and used clipped yews effectively. At Meudon, the estate of Cardinal Charles of Lorraine, which had been laid out by Philibert de L'Orme in the time of Henry II, Louis had a castle built for the dauphin. Here Le Nôtre built a double terrace and a great orangery.

On this commission his fountaineer was Loppin, who is remembered also for having written a book on fountains. This, of course, was not the only book on the subject; in 1661 Israel de Silvestre had written "Jardins et Fontaines" and in 1665 Jean François had published his "L'Art des Fontaines."

Le Nôtre's principles of garden design were set forth extensively in a work by his most loyal exponent, A. J. B. Le Blond, in "La Théorie et la Pratique du Jardinage," published nine years after the master's death. In this book he made an effort to scale down Le Nôtre's designs to the limited areas of smaller places. Gardens thenceforth were to be formal and laid out on flat or gently sloping sites, with canals and stiffly planted bosquets or thickets for shade and to serve as backgrounds for display. Beyond the bosquet lay the park. A wall separated it from the formal areas of the estate, but, at the end of the paths, to extend the view into the distant country-side along alleys cut in the woods, were wrought iron grilled gates or *clairvoyées*. Every effort should be made to make a garden appear larger than it actually was. Statues were to abound. Summer-houses were advantageously placed for decoration. Topiary sculpture also was abundant, and the architectural features of stairs and balustrades were pronounced. This formalism and symmetry extended even to small town gardens in Paris, the *petites maisons* where trimmed parterres and walls and clipped trees faintly echoed the glories of Versailles.

In the opening of this chapter we spoke of Le Nôtre as being the final flowering of the Renaissance. He is often said to have created a new style. However no great art or artist makes an abrupt cleavage with the past. Garden art, along with the others, flows on like a stream. Glance back at that stream. The secondary phase of the Renaissance was the baroque style, which, developed at Rome, had endeavoured to revive, in its massive, sumptuous proportions, the majesty of the ancient empire. Up to 1700 Europe was dominated by this baroque taste. In due time, it ran to excess. Le Nôtre is generally honoured for having constrained and purged it of some of its capricious, obese ornament. He gave it elegance.

Le Nôtre did not invent a new style of gardens; he carried on a very definite heritage of design. Even as far back as 1595, Mollet, gardener to Henry IV, had conceived the idea of a great avenue of elms leading to a court before the house and had placed behind the house flower parterres unobstructed by trees and hedges, through which were walks ending in a fountain or statuary. Likewise Boyceau had planned in the grand manner, which was the style Le Nôtre brought to its greatest perfection.

Although Le Nôtre worked in the grand manner, many improvements in details can be attributed to his genius. He refined the parterre, for instance, so that it fell into four well-defined kinds—*parterres de broderie,* in which the box edgings imitated embroidery; *parterres de compartiment,* in which the pattern was an inticate weaving of scrolls, grass plots, knots and flower beds; *parterres a l'Anglais,* which were either flat stretches of lawn or lawns cut with flower borders—for by this time England had convinced garden-lovers of the beauty of lawns; and finally *parterres de pièces coupées,* in which the entire design was worked out with symmetrical plantings of clipped box.

It may be remarked that Le Nôtre apparently used flowers very little. The fashion for them was going out in France, and for good reason. Once a *parterre de broiderie* made of clipped box and an intricate design of coloured sands was in place, its maintenance required a minimum of labour. There were no great plant factories in those days, turning out, as ours do, their millions of seedlings; consequently the parterre had to depend on its designs and coloured sands for effect. In this sensible solution of the problem of maintenance the great French masters of the parterre foreshadowed the philosophy preached today by designers of modernist gardens, who pave large areas with stone because the maintenance of lawns and flowers is expensive and bothersome.

Le Nôtre and Mansart also fathered the use of architectural treillage. Whereas before this time it had served merely as a support for vines or pleached fruit trees to divide or wall-in parts of the garden, it now began to be used for its own beauty, as garden backgrounds and for pavilions and gates. Special craftsmen or *treillageurs* were employed in making it. By 1775 the custom found a valuable voice in Roubo's "L'Art du Treillageurs."

In not every respect did some of the details of these regal French gardens measure up to our contemporary canons of good taste. Madame de Montespan's bronze tree that spouted water from its leaves, of course, had a heritage running back to Kublai Khan's tree that dripped milk and honey and wine; but when, in the Labyrinth at Versailles, we read of lead animals coloured lifelike, they are too reminiscent of the iron stags and St. Bernard dogs that decorated Victorian lawns to afford us any ecstasies of delight or arouse emulation. Nor am I so sure but that the fountains in the Théâtre d'Eau that danced to music were anything more than an exaggerated order of decadence. There was much about Versailles that served only to make a gross display of money and ingenuity. The people supplied the money, and it was no wonder that they eventually rose up against those who spent it so prodigally.

The Spread of Le Nôtre Gardens to England and Holland

From the plant that Le Nôtre set out, the seeds were carried far and wide. In England, Holland, Austria, Germany and even

Russia his pupils became court gardeners.

Charles II, thoroughly saturated with French taste during his years there, brought in the contemporary French style at the Restoration. At Hampton Court he planted a great avenue of limes around a semicircular parterre from which avenues radiated —put in a canal three-quarters of a mile long. In England Claude Perrault is said to have worked at Whitehall, St. James's and Hampton Court in 1718. Claude Desgots, Le Nôtre's nephew, was also employed in royal gardens there and returned to France to design gardens at Anet and the parks of Barmolet and St. Maur. From France came M. Beaumont to work on the garden of Col. James Grahame at Levens Hall, although, strange to say, he forgot his Le Nôtre teaching and made a garden there more Dutch than French. Many English gardeners went from England to France to study under Le Nôtre—among them, as we saw in the previous chapter, John Rose, gardener to Charles II.

Due to these influences several important gardens began to show evidences of the Le Nôtre touch—Bramham in Yorkshire, Melbourne, the seat of Sir John Coke, Wrist Park, the Duke of Kent's place, Holme Lacey and others.

While England did not accept Le Nôtre *in toto,* it did take and use the long avenue and the star-shaped plan of paths and roads. By 1709 Kip and Kyff in "Britannia Illustrata," and in Beeverell's "Les Délices de la Grande Bretagne et de l'Irlande," 1704 there were displayed many engravings of English noble gardens. These bird's-eye views, show the contemporary French taste as being accepted. Before this, in 1703, John James had translated Le Blond's book, "The Theory and Practice of Gardening," and it was widely read. Despite this, unfortunately the English failed to grasp the spirit of Le Nôtre—they were more inclined to substitute grotesqueness for grandeur. Their preference really was for the Dutch taste, with its absurd topiary work and its water toys, its weeping statues and dripping urns.

In Holland the Gallic influence in garden design was restricted by the fact that most of the land was held in small parcels by the middle class, and very few extensive estates, such as the French designs required, were available. Moreover, persistent winds and the omnipresence of water prevented the growth of those large trees with which to make vista alleys and high bosquets.

Le Nôtre's grand style did not make itself apparent in Holland until a quarter of a century after Versailles was completed. Holland was still enjoying its topiary work, which was the last taste it had imported from France. In due time, Daniel Marot, a pupil of Le Nôtre's (these "pupils" were probably assistant designers and draftsmen who had worked in his office) completed some gardens for William III and laid out several other Dutch estates, of which he published designs. Jacques Roman, another Frenchman, laid out the famous garden of Het Loo for William III, imitating several features of Versailles on a smaller scale. Dutch designers also followed the Le Nôtre tradition as closely as possible—Jan Van Call and Simon Schynvoet (1652–1727), who did splendid gardens around the Hague and along the banks of the Amstel and Vecht rivers.

The Dutch appear to have had a passion for books of garden views. In 1669 J. von de Groen had published his "De Nederlandsche Hovenier"—the Dutch Gardener—a work on country life in general that went into such details as designs for simple parterres and treillage and the cultivations of flowers, trees, vines and oranges. It was illustrated with views of Dutch gardens before they began to display French influence. In its French and German translations it found popularity for a century. Seven years after it came "De Koninglycke Hovenier"—the Royal Gardener—devoted to both garden design and the cultivation of fruit and flowers. It was likewise popular in England. The early 18th century saw several more works of like character published in Holland.

These books are mentioned to indicate the fact that the Dutch had their own nationalistic ideas of what a garden should be. Their interest in exotic plants and the influence of the East brought home by traders further affected their garden design. Holland was the plant nursery of Europe. Its early gardens were very much a product of the country's environment, but they also were quickly impressionable to gardening tendencies from outside their boundaries. Likewise did they produce influences that were imported by other lands.

In the previous chapter we mentioned Holland's tulip mania. Equally important was its influence on the cultivation of oranges. The Dutch doubtless first learned some of this orange culture *via* the Italians, for in the middle 17th century Genoa was a great nursery for orange and lemon trees. In orange culture the Dutch soon excelled, and their enthusiasm spread to both France and England, where the orangery became an important feature in gardens. Jan Commelyn's treatise on orange culture, "Nederlantze Hesperides," 1676, was translated seven years later in England and widely read there. Commelyn was director of the Amsterdam Botanical Garden. His nephew Gaspard, who succeeded him there, wrote in 1678 the famous "Hortus Amstelodamus," containing a collection of superb engravings that first displayed many new kinds of plants.

While the rich merchants of the cities copied, as best they could, the French notions, and built garden theatres of clipped hornbeam and made walled fruit gardens, the smaller person found consolation and inspiration in the reports of Kaempfer, home from the Orient. Engelbert Kaempfer (1651–1716) was endowed at birth with the wandering foot. As a youth he travelled through north-eastern Europe. At thirty-two he joined the Swedish diplomatic service and, in the course of his assignments for it, travelled extensively in Russia and Persia. In 1688, entering the Dutch East India Company as surgeon, he was dispatched to Batavia and, two years later, to Japan. He returned to Europe in 1694 and began writing his two works, his "History of Japan" and his "Ameonitates Exoticae," the latter a work on plants of the Far East. In the course of his Japanese history he describes little Japanese gardens, how even the smallest of them have "an old, in-grotted plane, cherry or apricot. The older, the more crooked and monstrous this tree is, the greater the value they put upon it." Small Dutch gardens began sprouting queer-shaped trees and from them went on to making those toy gardens, some of which exist even today—gardens with miniature bridges and canals and gazing globes and fantastic topiary work and tiny painted garden figures.

Le Nôtre to Other Countries

Just as avid collectors invariably claim that their paintings are veritable works of a master, so did owners of magnificent gardens in this era enjoy the rumour that none other than the great Le Nôtre himself designed them. It would have been humanly impossible for Le Nôtre to have designed even half the estates popularly attributed to him.

Under the wan light of just such reflected and rumoured glory basked the garden of the palace of Herrenhausen near Hanover, with its beautiful avenue of limes, its cascades and fountains in the French taste. The style was also copied in the Mirabell Schloss at Salzburg. At the near by Schloss Helbrunn, a French landscapist, M. Diesel, laid out a copy of Versailles and St. Cloud in magnificent fountains and water-works and an outdoor theatre. In 1715 another Frenchman, Le Sieur Girard of Paris, was appointed head gardener and fountaineer at Nymphenburg. Among his achievements there was a fountain that tossed its water eighty-five feet in air, and a great canal ending in a cascade and basin flanked by high walls of clipped trees. Girard also laid out the gardens of the Princes Lichtenstein and Schwartzenburg at Vienna and he and his assistants did various gardens around Munich in which they spread themselves on magnificent parterres, extensive bosquets and impressive water-works.

Even Poland caught the Le Nôtre fever. Stanislaus I, when he built his palace of Lazienki at Ujasdow, copied the French master as closely as he could. It is said that he lacked sufficient statuary to make a really impressive showing, however, so, when he held garden fêtes, he employed men and women, dressed in classical costumes, to pose stiffly in the shrubbery niches and along the basin rims! Near St. Petersburg, at the bidding of Peter the Great, the French architect, Le Blond, built the pleasure palace of Peterhof and laid out French gardens around it. One item was a shipment of forty thousand trees transplanted from the forests, and other trees were hauled all the way from western Europe.

Swing back to Spain, and we find another country reacting to the French taste. Le Granja, the favourite summer place of the Spanish court sixty miles from Madrid, had its château and gardens both built in conscious imitation—although on a much smaller scale—of Versailles. However, it could boast one feature that even Versailles lacked; it had a water jet that reached the amazing height of one hundred and sixty feet, which, of course, completely swamps Nymphenburg's mere eighty-five-foot column of water.

So far-reaching was the influence of Le Nôtre that some believe the Middleton Garden near Charleston, South Carolina, to have been laid out with Versailles in mind.

French Botanists and Flower Lovers

While on magnificent places both at home and abroad Le Nôtre's grand manner was being imitated slavishly, by no means did all of France agree with him. To be sure, the latter part of the 17th century saw the rise in France of a taste for greater luxury and comfort, which spread from the Court down through the French country-side, by no means did this invariably affect the layout of the grounds of all the provincial nobility and gentry. Many of these country gentlemen were farmers, and by the end of the reign of Louis XIV some of them were in such a bad way that they were obliged to do the farm work themselves.

The garden of this *gentilhommière,* or small country estate, was designed to combine pleasure and utility. It grew flowers and vegetables together in democratic accord. Nevertheless, it had a definite form and it was invariably walled, with fruit trees trained on it and a *columbier* or dove-cote at the corner or in a tower. While the big places might change with the new taste, the smaller estate continued to hand down the Renaissance garden tradition. The *potager* or vegetable garden was always an indispensable feature. Its beds were edged with flowers, just as the old Romans had planted violets and roses around their patches of onions, turnips, asparagus, radishes and beans—and that style prevails today in France on small places and is copied in hundreds of small gardens in other lands.

Le Nôtre, it has been noted, was as careful in his selection of horticulturists as in the choice of co-operating artists; still he cannot be said to have displayed any great passion for flowers *per se*. He used them as elements in his designs, but to him they were merely so much plant material. Even at Clagny, which Madame de Sévigné describes, where Le Nôtre set out beds of tuberoses, jasmine and carnations as ground-planting for a grove of tubbed orange-trees, one is conscious of the formality of their handling. This attitude was not shared by all his countrymen. There were many to whom the individual flower was vastly important.

Already France was making its way in botany. The Jardin des Plantes had published its catalogue in 1660. Twenty-three years later there came as demonstrator to the gardens a man of twenty-seven, destined to attract fame—Joseph Pitton de Tournefort (1656–1708). His family started him for the priesthood, but so persistent was the "tug" of plant life that he fled the seminary and took up botany in earnest. He went to Montpellier in 1679 when he was graduated in medicine. For post-graduate work he botanized in the Pyrenees and Catalonia, after which he received his appointment at the garden. The authorities there dispatched him to Spain, Portugal, Holland and England to collect plants. In 1694 he wrote "Elemens de botanique" and in 1700 "Institutiones Rei Herbariae." In these works he proposed and used a method of plant classification by genera, rather than by species with which most of his contemporaries worked. He created some eight thousand groups, dividing them into twenty-two classes according to the form of the corolla.

This system prevailed in France for nearly a century until Bernard de Jussieu introduced the Natural System of plant classification. Tournefort not alone travelled extensively on the

Continent, but in 1700 also began a three year plant-hunting journey to the Levant.

At the Jardin des Plants he was succeeded on his death by Antoine de Jussieu, nephew of the aforementioned Bernard; so that, by the opening of the 18th century, the remarkable de Jussieu clan were on their way to making botanical history.

While in Montpellier University both Tournefort and Bernard de Jussieu were fortunate enough to be pupils of Pierre Magnol (1638–1715). The average gardener remembers him in the magnolia, named for him; but his fame rests on his botanical teachings and writings. In 1685 appeared his "Botanicum Monspeliense," a flora of the neighbourhood, and, five years after his death, his "Novus Character Plantarum."

In the less strictly scientific lines France also made advances. Way back in 1654, De la Chesnée Monstereul had written the first horticultural monograph—"Le Floriste François." It was devoted to the tulip, which he held to be supreme over all other flowers. This was the forerunner of all those monographs we gardeners study and enjoy today—Elwes on lilies, Willmott on roses, Dykes on iris, Praeger on sedums and sempervivums.

Another practical flower author of this era was Sieur Louis Liger of Auxerre, who wrote "Le Jardinier Fleuriste," 1719, which London and Wise, the English nurserymen, translated under the title "The Retired Gardener." Before this time John Evelyn had encountered a flower enthusiast in M. Morin of Paris, who not only grew ten thousand tulips, rare anemones, ranunculus and crocus, but also had a crucifix in his garden done in clipped work, purselane and coral! In 1665 Pierre Morin wrote "Remarques Nécessaires pour la Culture des Fleurs."

The turn of the century brought other gardening books spilling from the French presses. In addition to Le Blond's explanation of Le Nôtre, which is mentioned above, there appeared in 1713 A. J. Dezallier Argenville's "La Théorie et la Pratique au Jardinage," and, a few years afterward, the two works of Le Maistre, curé of Joinville—"Fruitier de la France" and "Une Dissertation Historique sur l'Origine et les Progrés des Jardins."

Rumblings of Naturalism

A few paragraphs above we encountered Charles Dupresny's efforts to make more open, naturalistic gardens. There is still another figure to consider—Pierre Daniel Huet (1630–1721) who, in no uncertain terms, spoke his mind on Le Nôtre's designs. Nor did he speak from obscurity. In 1670 he was appointed tutor to the dauphin, in 1674 made a member of the French Academy and in 1685 raised to the bishopric of Avranches. Meantime for twenty years he was editing editions of the classics and keeping his pen busy setting down his thoughts and observations. These "Huetiana" were frankly directed against the taste of his day and in defence of natural beauty.

He claimed that natural beauties were preferable to artistic. Nothing in France pleased unless it was costly. "A fountain issuing in great cascades from the foot of a rock, tumbling over a golden sand the clearest and freshest water in the world, will not please the people at court as much as a jet of foetid and muddy water drawn up at enormous cost from a frog marsh. A factitious parterre, composed of earth brought together according to a plan of M. Le Nôtre, having for its whole decoration but a few rows of box, which never distinguish the season by change of colour; surrounded by vast sanded alleys, very compact and very bare; such a parterre forms the delight of polite society. It leaves to small cits and peasants these rustic lawns, this rural *turf.*" *In another essay* he wrote:—"I have no more approval for *the gardens in fashion than for iron clairvoyees. I mean those gardens, composed of large, broad, sand-strewn alleys, of trellises,* parterres, adorned only with a few delicate beds, defined by strips of box and edged with a few flowers, and a few stunted trees, and in which you can scarce distinguish summer from winter. . . ." Then he speaks of Le Nôtre's covered alleys, shaped woods, trees of lofty trunk, palisades and green shades. "The majority of private persons, possessing neither sufficient ground, nor sufficient means to give their gardens all these ornaments, and keep them up, have only adopted its parterres."

In his rumblings was presaged a revolt against the existing order of gardens. Meanwhile other factors, destined to play a part in the overthrow of formalism, were getting under way. Far out in China Frs. Attiret and Castaglione were painting murals in the Chinese emperor's new pleasure place, and now and then, properly escorted, were allowed to walk in the vast gardens surrounding the palace. Down in Italy, now that he was dead, collectors were beginning to prize and students to admire the awesome landscape canvases of Salvator Rosa, and in France they were becoming adjectival over the milder canvases of Claude Lorraine. The stage was fairly well set for a turn in garden taste. The best vantage point from which to watch it next is England.

CHAPTER XIII

GARDENING IN EIGHTEENTH CENTURY ENGLAND

IN all the long Story of Gardening there never was so great a century as the 18th. That expanse of vivid years witnesses an amazing variety of gardening developments. It sees the revolt against formalism in garden design and the spread of the English romantic garden over the Continent. It sees Oriental influence seep into France and the consequent rise of the Rococo taste. It sees exploration become a race for new lands between nations and, with that exploration, the finding of hosts of hitherto unknown plants. Great figures in botany and horticulture arise during this century. Countless books and articles spill from the presses. The gardening urge begins to pulsate in far-flung colonies. So many and diverse facets does the Story of Gardening develop in this century that we are obliged to paint them in broad strokes.

England's Lingering Formalism

The gardens of the time of William and Mary had been characterized by a fussy formalism. Long before their reign the Dutch influence had appeared in English gardens; with their accession to the throne, it became the dominant taste. Topiary work flourished to excess. Gardens abounded with flowers and were well stocked with such pleasant accessories as sun-dials, summer-houses, lead cisterns, dove-cotes, and, on pretentious places, elaborate orangeries and conservatories. Bowling greens were still a feature in well-appointed gardens. The gardens were generally walled and here and there, at points chosen to extend the view to the outside world, the walls were broken by those ornamental grilles the French called *clairvoyées*. Along the walks and around the scroll-work parterres were set Dutch jars and orange and lemon trees planted in boxes. On small places these Dutch gardens degenerated into a conglomeration of absurd miniature dodabs—glass balls and coloured sands and earth, gnomes and decorative flower-pots and perspectives painted on walls, and canals that were little more than ditches.

Queen Anne Gardens

Under Queen Anne began to appear several other features that pronounced the formality of the garden, the main contribution being trees clipped to form solid walls high in air. These were set on each side of long, broad avenues. Lead statues became more popular than ever, portrait busts especially, and sometimes they were sanded to represent stone—a quaint artificiality!—and sometimes gilded.

Thus up to the second decade of the 18th century the English garden was either formal after the French grand manner or formal in the stiff, artificial Dutch style. And yet problems of garden design were not universally foremost in the minds of Englishmen. The English have always been able to maintain a nice balance of interest between the form of their gardens and the plants growing in them. It was definitely so in this era, and it produced many unusual characters and many memorable books.

A dynasty of influential nurserymen arose at this time. Under

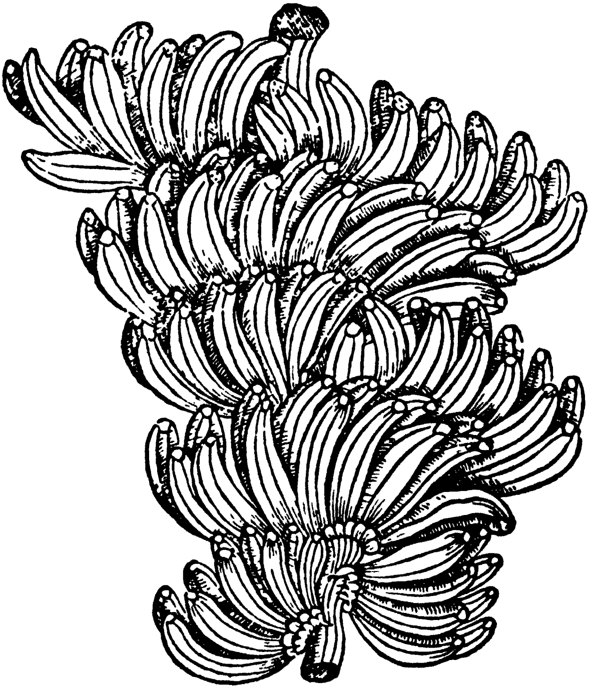
William and Mary the head gardener at Hampton Court was George London, who had been a pupil of John Rose, garden superintendent to Charles II. At Hampton Court London carried out many improvements, including a great parterre of box. Down at Fulham Palace, old Bishop Compton, a loyal supporter of William and Mary and a superb gardener to boot, was busy filling the ground with exotics gathered from all corners of the world. At one time George London had been his gardener. Under Queen Anne the royal gardener became Henry Wise. Relieved of his court post, London devoted himself to laying out private estates in various parts of the country. Eventually these two men established at Brompton a nursery that was to maintain its reputation through several decades. On the death of London in 1713, their pupil, Stephen Switzer, was taken into the firm, and, in time, Switzer was followed by Bridgman, who also became gardener to George I at Richmond.

In addition to the gardens for which this dynasty is remembered, their popularity grew with books they wrote or edited. In 1699 London and Wise published a translation of De La Quintinye's "The Compleat Gardener," which ran into three other editions, and in 1706, Louis Liger's "The Retired Gardener." To each of these they added copious notes and observations of their own. In 1715 Switzer composed "The Nobleman's, Gentleman's and Gardener's Recreation," which, three years later and greatly amplified, he re-published under the learned-sounding title of "Ichnographia Rustica." Before the appearance of this last volume the gardens they laid out were either in the grand and noble style of the Le Nôtre tradition or in the style of Holland. From these they were gradually weaned away. First they strove to simplify the formal styles, and then abandoned them altogether for what Switzer termed "Rural and Extensive Gardening."

At the same time there were other writers with whom this matter of form carried very little weight. Of the fifty different volumes written on the various phases of horticulture and botany in the first twenty-five years of the 18th century in England, only a handful need be mentioned. The one most devoted to form appeared in 1703 when John James published his translation of Alexander Le Blond's "Theory and Practice of Gardening," which was based primarily on the Le Nôtre style, judiciously watered down for owners of modest estates. The reading public supported it through two more editions. The same year saw Henry Van Oosten believing sufficiently in the Lowlands style to publish "The Dutch Gardener." At this time Richard Bradley began to be appreciated for his paintings and writings on succulent plants and later for his "Gardener's Kalendar" and his "Dictionary of Plants." Bradley had his own theories on the movement of sap and on plant fertilization, and it was due to the latter that nurserymen began cross-fertilizing and improving species. With an eye on the fair sex, Charles Evelyn wrote "The Lady's Recreation," in 1707, and was rewarded by their demanding two more editions.

Another interesting character was the Rev. John Lawrence, vicar of a Northamptonshire parish and prebend of Salisbury, who first attracted attention by writing "The Clergyman's Recreation" in 1714, and then followed it with five other gardening books in the next twelve years. Lawrence was one of sixteen English clergymen who wrote important gardening books in the 18th century. Tournefort's "Complete Herbal" was Englished and appeared in 1719, and by 1722 Thomas Fairchild was instructing Londoners in the plants that would thrive there by writing "The City Gardener."

Fairchild's garden at Hoxton, where he laboured for thirty years, was the scene of many experiments in grafting and cross-fertilizing, and he made the first serious contribution to the study of variegation. In this garden he found he could grow—and Londoners could do likewise—ilex, Spanish broom, lilacs, jasmine, viburnums, pinks, daisies, French marigolds, hyacinths, wallflowers, lilies of the valley, mock oranges, pears, figs and grapes. He advised growing apples in tubs. Fairchild's legacy, remembered today, is a sermon delivered each year at St. Leonard's, Shoreditch, by a preacher appointed by the Bishop of London, for which purpose he left the funds.



THE FIRST BUNCH OF BANANAS RIPENED IN ENGLAND WAS DISPLAYED IN THE WINDOW OF A LONDON APOTHECARY AND BOTANIST, THOMAS JOHNSON

About the same time as "The City Gardener," appeared a monumental work from the pen of Philip Miller—the "Gardener's and Florist's Dictionary," 1724. Miller was curator of the Chelsea Physic Garden, where he carried on many experiments. He was one of the first to observe the part played by insects in fertilizing flowers. His dictionary went through many editions and was translated into Dutch, French and German. He further added to his fame by editing the catalogue of the Society of Gardeners, an organization we shall learn more of later on. To Miller is attributed the introduction of almost two hundred American plants.

Three other developments are noticeable in these opening years of the 18th century—England had entered on her great era of lawn-making, an era that has never since ceased; her truck gardeners were growing many more kinds of vegetables and learning the technique of producing them out of season; and in the gardens were beginning to flourish countless new plants brought in by traders and plant explorers. We can also mark the first improvements in farm and garden tools. Each of these subjects deserves elaboration.

Although in the great age of grafting new tools were invented to serve the gardener's purposes, little advancement was made in other implements. The simplicity of the plough, the hoe, the rake, the spade seemed almost to defy improvement. Nevertheless, in the beginning of the 18th century Jethro Tull invented a seed drill and a horse hoe, and their introduction led to others that made both the farmer's and the gardener's work lighter and more efficient.

London was ringed about with nursery gardens and orchards that supplied the tables of the city. Instead of importing them from Holland, Londoners began to know what it was to have brought in from near by truck gardens fresh and early asparagus, cauliflower, cucumbers, interesting varieties of lettuce and excellently grown small fruits—strawberries, raspberries, currants and gooseberries. From the hothouses regular crops of melons and pineapples were issuing, and by 1717 nurserymen were thumbing over the book Samuel Collins wrote on forcing melons and cucumbers. In fact, we might set down New Year's Day 1721 as a horticultural landmark, for on that date did a nurseryman by the name of Fowler present to George I the first cucumber raised under glass.

The gardens also saw growing for the first time new varieties of kalmias, camelias, magnolias, rhododendrons, hydrangeas and other ornamental trees and shrubs. Later on, the China aster was introduced and the chrysanthemum, and phloxes and dahlias were grown for the first time. The first exotic orchid to reach England, *Bletia verecunda,* arrived from the Bahamas in 1731.

Early in the first quarter of the century, twenty practical London gardeners, who were interested in these new plants, formed a little organization—the Society of Gardeners—the first of its kind in England. For five or six years they foregathered each month at a coffee house where, for the edification of their own limited circle, they displayed and discussed the new and unusual plants they were growing. At the end of six years, from the records of these plants, they decided to make a catalogue and Miller was chosen as its editor. Jacob van Huysman, brother of the famous Dutch painter, was hired to draw the illustrations. Only one part appeared—a section devoted to hardy shrubs, in which many unusual American plants were included. Thus was being evolved, even this early, the germ of the London Horticultural Society, founded in 1804, from which sprang the Royal Horticultural Society and its magnificent flower shows and publications.

But for all the new vegetables and flowers and shrubs, the greatest glory of all was the English lawn. Gardeners had been realizing that their climate was especially favourable to lawn-making and maintenance, and many of them set down instructions on these subjects. The English lawn became the envy of gardeners everywhere, as it has been ever since.

Though I have never seen the theory advanced, I have a conviction that the English lawn may have been one of the factors that induced the tide to turn against the formalism of the Dutch garden and the geometrical exactness of the French, for this revolt broke down the walls and hedges that enclosed gardens so that their lawns could encroach on the surrounding meadows and country-side.

The revolt was instigated by philosophers, poets, journalists, painters, etchers and critics of art, and the steps in both the evolution of the English landscape garden and the cult of the romantic and picturesque that followed it are well marked by milestones inscribed by pen and brush.

The Revolt Against Formalism

It is the usual custom to push a peg into a certain date in English journalism and say, "Here began the landscape movement." To understand this date, however, one must travel a little further back.

Whether directly or vicariously, Italy has always been the mother of gardens, and it was influence from Italian sources that caused the English turn of the tide against formalism. Italy was the Mecca of the Grand Tour, and the Italian impressions received by those who took it were indelible. Between 1698 and 1740 not alone students but a vast host of otherwise cultured persons were travelling Italyward. The naturalistic movement that sprang up in England was set going by two men who had steeped themselves in this penetrating Italian scene. The first was a philosopher, the Earl of Shaftesbury; and the second was a journalist, Joseph Addison. To these was added a third, a poet—Alexander Pope.

Shaftesbury had travelled extensively in Italy (he was first there from 1686 to 1689) and knew well both its gardens and its paintings. Especially did he admire the landscapes painted by the gentle Claude Lorraine, the bizarre, vivid Salvator Rosa and those by Caspar and Nicolas Poussin. Lorraine's canvases were soft, picturesque and rural. He devoted practically all his painting to scenes of the Campagna. Rosa specialized on views of rocks and desolate scenes of violent Nature and extravagant grottos and ruins that gave his canvases a savage, awe-inspiring air. The Poussins went in for antique buildings and figures. All of them delighted in showing historic landscapes and fragments of classical ruins that reflected the erstwhile grandeur of Rome and the vast prospects of the Campagna. Collecting these pictures soon became a hobby with men of wealth in England, and English artists copied their styles slavishly. Such were the canvases Shaftesbury most delighted in, and it was their influence that induced him to pen the manifesto of the new revolt. It is contained in an essay written in 1711, in which he stated that he could no longer resist the passion growing in him for things of a natural kind. "Even the rude Rocks, the mossy Caverns, the irregular unwrought Grottos, the broken Falls of Water, with all the horrid grace of the Wilderness itself, as representing Nature more, will be the most engaging, and appears with a Magnificence beyond the Mockery of princely Gardens."

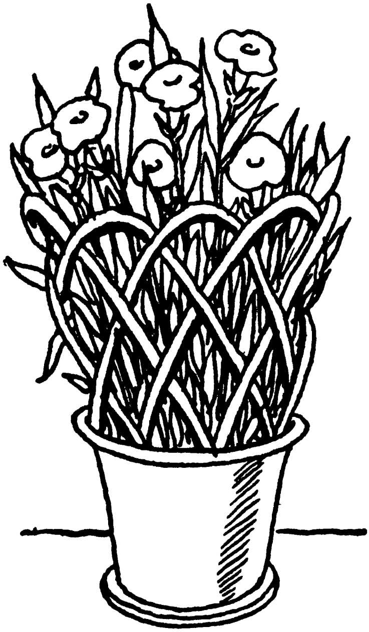
The year before this, Joseph Addison had enthused over the beauties of the Roman Campagna to which he had been attracted by the landscape paintings he saw in Rome—those wild scenes, unencumbered by walls or hedged enclosures, of plains and meandering rivers. Two years later this impression found definite voice in an article appearing in the *Spectator*, and a few days later another. In these his admiration for views of wild Nature developed into a spirited attack on Le Nôtre and the Dutch garden style, especially its topiary trivialities. "We see the marks of the scissors," he complained, "upon every tree and bush." He soon was suggesting that "a whole Estate be thrown into a kind of garden by frequent Plantations."

The third to take up the fight was Alexander Pope. In his poem on Windsor Forest, 1712, he also attacked topiary sculpture and, the following year, burlesqued it magnificently in a hilarious paper contributed to the *Guardian* "A Quickset Hog shot up into a Porcupine by being forgot a week in rainy weather. . . . A Lavendar Pig, with sage growing in his belly. . . ." Such were his *mots*. They set England laughing. The ridicule definitely killed topiary work.

Neither of these last two warriors for naturalism can be said to have succeeded in carrying out their theories in their own gardens. Addison's garden at Bilton in Warwickshire appears to have been definitely Queen Anne, and in his five acres at Twickenham, Pope crowded a jumble of naturalistic features and lilliputian scenery that today would be judged the height of bad taste. The famous grotto, the delight of his declining years, as we read of it in the account written by his gardener John Serle in 1745, sounds just about as horrible as anything could be—it was "finished with shells, interspersed with pieces of looking-glass in angular forms." Indeed, apart from Switzer and Bridgeman, these first apostles failed lamentably to practise what they preached. It remained for others actually to interpret and further the landscape garden.

The first was William Kent (1684–1748) a man highly talented in many respects and, in his heyday, the arbiter of English taste. He was an architect, a painter and a sculptor. With equal ease, he designed furniture, picture frames and silver plate. He illustrated books and laid out landscape gardens. His *repertoire* ran from babies' cradles to petticoats, for he actually did clothe a lady of quality in a petticoat of his own designing that displayed the columns of the five architectural orders! Although he painted the murals in many great houses, including Kensington Palace, he is best remembered for his furniture and his gardens.

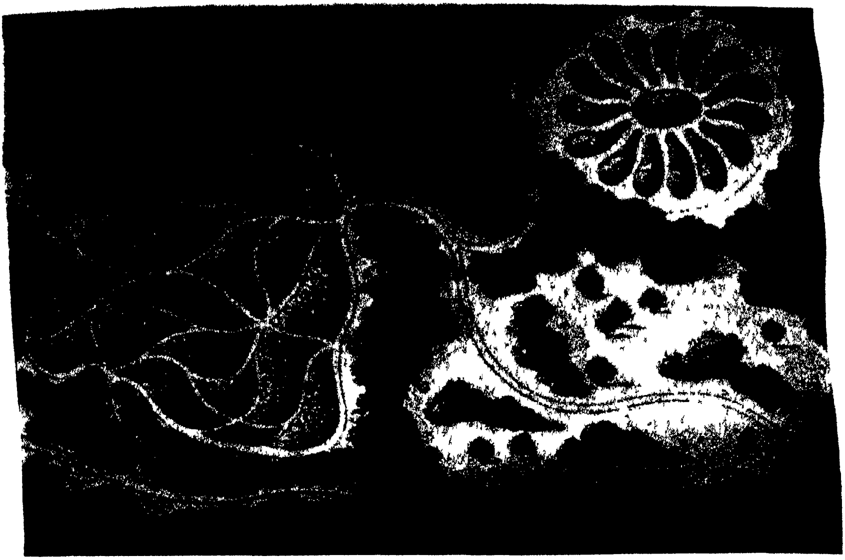
He was born humbly in Yorkshire, found his first work by being apprenticed to a coach builder, later came to London and studied art and continued his studies during his four-year stay in Rome. While there he became inspired by the landscapes of Claude Lorraine and the Poussins. In 1721 he received a commission from the king to decorate Kensington Palace, and thenceforth his word and taste carried weight.



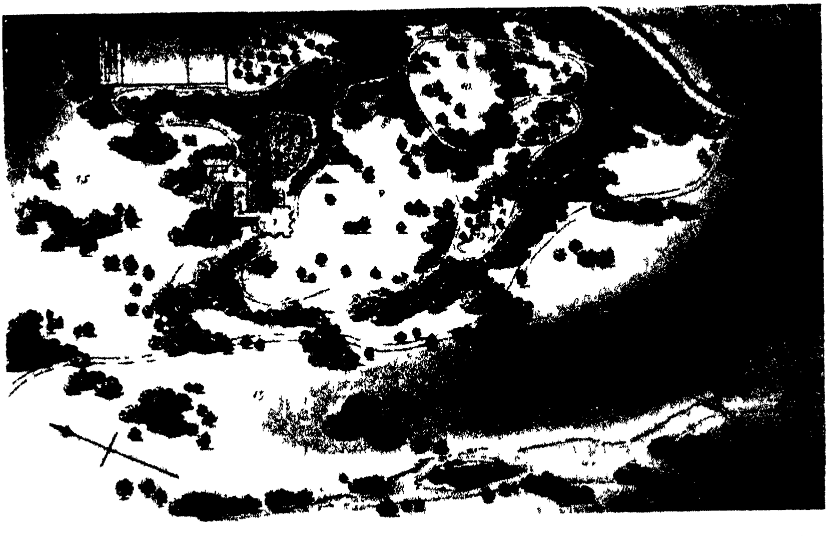
WIRE PLANT SUPPORT FOR GROWING CARNATIONS

He believed that gardens should be pictorial and idyllic. He tried to realize in them the effects that his painting masters laid on their canvases—the soft, historic landscape of the south. As destroyed many grand avenues that he might twist his walks and roads aimlessly. He turned ornamental sheets of water into lakes with brooks and waterfalls. When anyone questioned his deliberate destruction of these old places he sententiously explained that his gardens were not intended to copy Nature, but to idealize it. In Kensington Gardens he even planted dead trees "to give the greater air of truth to the scene." Kent's great monuments were the gardens at Chiswick and Stowe—with its famous Palladian bridge—and Holkham.

Along with Kent came Batty Langley (1696–1751), who sounded the trumpet for rural gardening in his "New Principles of Gardening," 1728, devoted, so the title page runs, to "The Laying out and Planting Parterres, Groves, Wildernesses, Labyrinths, Avenues and Parks, after a More Grand and Rural Manner Than Has Been Done Before." His rural gardening, however, was in the spirit of the old Roman ruins. He advised introducing ruins at ends of avenues of trees, either ruins actually built of brick and plastered to imitate stone—or painted on canvas and hung up! In fact, Langley's ideal garden would contain a wonderful and fearful assortment. He states "that the several parts of a beautiful Rural Garden are Walks, Slopes, Borders, Open Plains, Plain Parterres, Avenues, Groves, Wildernesses, Labyrinths, Fruit-Gardens, Flower-Gardens, Vineyards, Hop-Gardens; Nurseries, Coppiced Quarters, Green Openings, like Meadows: Small Enclosures of Corn, Cones of Evergreens, of Flowering-Shrubs, of



PLAN FOR A FLOWER GARDEN AND ROSE GARDEN IN THE LATER NATURALISTIC ENGLISH MANNER. FROM RICHARD MORRIS' "ESSAYS ON LANDSCAPE GARDENING," 1825



MORRIS ALSO SUGGESTS THIS TREATMENT OF THE PLEASURE GROUNDS SURROUNDING A VILLA

PRINCE PUCKLER MUSKAU, OF GERMANY, LANDSCAPE DESIGNER

EDWARD VON REGEL, GERMAN BOTANIST AND PLANT EXPLORER IN RUSSIA

GREGOR MENDEL, ABBOT OF BRUNN AND STUDENT OF HEREDITY IN PLANTS

DAVID DOUGLAS, AN ENGLISH PLANT EXPLORER TO CALIFORNIA AND CANADA

FOUR LEADERS IN THEIR WORLDS

Fruit Trees, of Forest-Trees, and mix'd together; Mounts, Terraces, Winding Valleys, Dales, Purling Streams, Basons, Canals, Fountains, Cascades, Grottos, Rocks, Ruins, Serpentine Meanders, Rude Coppies, Hay-Stacks, Wood-Piles, Rabbit and Hare-Warrens, Cold Baths, Aviaries, Cabinets, Statues, Obelisks, Manazeries, Pheasant and Partridge Grounds, Orangeries, Melon-Grounds, Kitchen-Gardens, Physick or Herb-Garden, Orchard, Bowling Green, Dials, Precipices, Amphitheatres, etc."

Batty Langley's name is also associated with the revival in Gothic and mediæval taste which appeared at this time—a taste that caused Horace Walpole to confess, perhaps as an explanation for Gothicizing his own house at Strawberry Hill, "A Gothic church or convent fills one with romantic dreams."

Romantic dreams were the principal motivation of these landscape gardens. "Fabricks" and ruins were essential to them. They subsequently ran the gamut of all periods, styles and countries—Roman, Saxon and Gothic, monastic and oriental, rustic huts and hermitages. These were deliberately placed in gardens, just as artists used them on their canvases, for composition effects. Since we are naming names, we might state that the fashionable designer of such ruins was one Sanderson Miller.

The poets, of course, rejoiced in these new ventures. From 1728 on, James Thomson, in "The Seasons," was hymning the glories of the rustic scene. Another poet, Shenstone, likewise took up the cudgels and worked out his theories on his own place, Leasowes, which he ornamented with everything that might arouse the emotions—weeping willows, urns, trophies, garlands, columns broken and unbroken, mottoes and inscriptions. This was by no means the initial appearance of the weeping willow, for that remarkable tree was first planted at Twickenham in 1748 by a Mr. Vernon, a merchant in the Turkish trade at Aleppo, who, returning to England, brought home slips of it with him. It later became a symbol of the Victorian taste. But to get back to Shenstone—his main contribution was a belt or broad winding walk that surrounded the garden and connected the various separate scenes. He set down his landscaping credo in "Unconnected Thoughts on Gardening," 1764, a book in which first appeared the terms "landscape gardening" and "landscape gardener."

Following his precepts, many land-owners went in for the ornamental farm. In fact, Shenstone was one of those many country gentlemen landscape gardeners who sprang up in this era, a group that included such names as Lyttleton, Pitt and Charles Hamilton.

Charles Hamilton, by the way, on his grounds at Pain's Hill, near Cobham in Surrey, had a hermitage and maintained in it an aged man who acted as a realistic hermit—but not for long. He was to be provided with a Bible, glasses, a mat for bed, a hassock for pillow, an hour-glass for time-piece and food from the house. He was to wear a robe, never shave or go beyond the grounds and never speak to the servants. If he held the job seven years, he was to be paid 700 guineas. There was only one aspirant, and he lasted three weeks.

Of another estate the neighbours complained that the hermit's life was cruel, and the garden owner was forced to substitute a dummy. On still another, the hermit was dismissed for getting too familiar with one of the milkmaids. But this is no place to go into that.

In its earliest days the firm of London and Wise had been given to making neatly balanced designs and to clipping evergreens precisely into cones and globes and pyramids. With Switzer and Bridgman, as we have seen, these formal notions were abandoned. Bridgman in his compositions used numerous groves of oaks and cultivated fields. To him likewise is attributed the Ha-Ha (although some say that Kent's partner, Buckingham, first hit on the idea, and some that it was invented in the time of Henry VIII). This is a deep, wide trench, placed either around the property or along the edges of vistas, so that stray cattle could be kept out and at the same time the adjacent meadows and parks visibly brought into the garden picture. Byron, in the 10th canto of "Don Juan" makes a vivid thumbnail sketch of this unobstructed, cultivated country-side:

> On, on! through meadows, managed like a garden,
> A Paradise of hops and high production.

It might seem strange that England, so long accustomed to formal gardens and taking such pride in them, could so quickly turn about-face and tolerate their ruthless destruction. The truth is that these new landscape gardens were a glorification of the land, and England's pride in the land has never been concealed. Landscape gardening easily became an expression of national pride. It was the fashionable diversion of the landowning class. It set the style for men of means and leisure, not alone to show an interest in the agricultural improvement of their acres—an interest English land-owners have always displayed—but to dabble in the æsthetics of rural life. The gentleman architect and landscape architect came to the fore, and what they did in England, so we shall see in the next chapter, did land-owners in America—around Boston and up the estuaries of the Chesapeake and along the James River.

The land, his land, his natural birthright, to do with as he pleased, stood, in this era, as a great national symbol. The changing of its character near homes, under the next figure, became a great national passion. The peak of naturalism and the nadir of the formal garden in England was reached with Lancelot Brown (1715–1783), of whom it has been said that he changed the face of England.

He was popularly known as "Capability" Brown because of his habit of gazing at a site and declaring that it had "capabilities." This nickname probably had much to do with his success. He was born of humble origin and for a time laboured as kitchen-gardener. A collaborator and pupil of Kent, he worked on Stowe and other commissions, but his first chance came when he made an artificial lake for the Duke of Grafton at Wakefield Lodge. By 1750 his fame had so spread that he was appointed royal gardener. He soon acquired an enormous practice, including both Kew and Blenheim, that brought him great wealth and an overweening opinion of himself, for he appears to have been a pompous individual. Through the 50's and 60's his taste reigned supreme. The ultimate ambition of every aspiring land-owner was to have Brown "do" his garden. And "do" them he did, with a fierce and exuberant gusto. No man more ruthlessly destroyed great and noble gardens that he might supplant them with his own versions of what a garden should be. He found many loyal champions, among them the Rev. William Mason who eulogized him in the poem, "The English Garden," 1772—a very dull poem, to be sure, and yet a stout defence.

The next figure to appear in this pantheon of naturalists was Humphrey Repton (1752–1818) who, though lacking Brown's widespread influence and pomposity, did prove to be quite an individual. He was the first to advertise himself as a "landscape gardener," and he developed a clever selling method of his wares. Not until he was thirty-six did he venture on garden-making as a profession; in fact, before that time, he was a failure. As a young man he was sent to Holland to learn the calico trade, from which apprenticeship he returned to Norwich to open a general store. This proved a bad investment, and he was forced to retire to a small country cottage. While in this rustic banishment, a friend suggested that he study botany and gardening. The result of these varied experiences was that he brought to his new profession a mature viewpoint. At first he championed Lancelot Brown's style, after which he modified his views for a more natural and varied type of garden which would combine, so he claimed, "artistical knowledge with good taste and good sense." At this time good taste was just beginning to appear as a *sine qua non* of gentlefolk.

Repton laid aside the arguments of those who had been to Italy and succumbed to the canvases of Rosa and Lorraine. He held that garden art should not merely copy the art of the landscape painter. While natural beauties should be displayed and natural defects hidden, the most desirable feature of a garden should be its expansiveness, its air of extent. He eradicated boundary marks of all kinds so that the place appeared as though it were a product of Nature herself. His theories he set forth in twelve publications, in one of which he included his ingenious before-and-after views. When he undertook a commission, he first made a study of the place as it existed, then another as he proposed to change it, the latter folding on top of the former. This made a pronounced "hit." By 1794 Repton had improved fifty places. Four years later he went into partnership with the architect, Nash. His last volume, "Fragments on Landscape Architecture," 1816, was mainly about Ashbridge, an estate where he laid out no fewer than one hundred and fifty different kinds of gardens.

Repton's theories found support in Thomas Whatley, a member of Parliament and a Shakespeare scholar of standing, who in

1774 wrote, for the ear of the cultivated amateur, his "Observations on Modern Gardening." Nature, he acknowledged, was far from perfect, and it was the designer's business to correct those imperfections, in addition to improving the beauties of the site. Whatley's book bore quite an influence on French taste.

By no means did these naturalists have things all their own way, nor did they influence all classes. The titled and upper gentry, as in all ages, took up the new fashion; the ordinary folk clung to their little formal gardens. Both Brown and Repton suffered criticism and there was a constant cross-fire from camp to camp. Horace Walpole wrote his "Essay on Gardening," in which he summed up the work being done; and in 1794 Richard Payne Knight published his "The Landscape" and Sir Uvedale Price his "An Essay on the Picturesque as Compared to the Sublime and the Beautiful." In these Repton was severely criticized and obliged to answer them in his "Sketches and Hints in Landscape Gardening," and in the third quarter of the 18th century appeared a counter movement. In 1772 Sir William Chambers had produced, "A Dissertation on Oriental Gardening."

As a youth Chambers had made a voyage to China during the 1740's in the service of the Swedish East India Company and had then taken ten years in Italy to study architecture. He returned to England in 1755 and became architectural tutor to the Prince of Wales, later George III. His first book, "Designs for Chinese Buildings," came out in 1757, with a chapter on Chinese gardening which was little more than a summation of the report that Fr. Attiret, missionary-painter at the palace of the Chinese Emperor, had sent home to France. This report had been translated into English five years before.

This was not the first news of Chinese gardens England had heard, for Père J. B. Du Halde's book on the Chinese Empire, published at Paris in 1735, had been Englished the next year and widely read. Nevertheless credit is generally given to Chambers for getting over the idea that Chinese gardening was based on something more than mere strange æsthetics; it displayed a deep-laid symbolism.

In 1758 Augusta, mother of George III, commissioned Chambers to lay out Kew, then a royal residence. He built a mosque with two minarets, an Alhambra and the pagoda which is still standing. In its original state this pagoda was embellished from top to bottom with gilded dragons. Having these experiences behind him, he could then attract serious attention by his "Dissertation on Oriental Gardening." In this book Chambers attacked the destructive work of "Capability" Brown. In turn, Lord Kames in his "Elements of Criticism," 1762, attacked Chambers' oriental fantasies.

This outburst of the Chinese taste was a repercussion from the rococo style that was influencing France so delightfully at the time. In England, however, it never got much beyond the oriental garden features of Chambers and the freakish output of his copiers, and the Chinese types of furniture designs executed by Thomas Chippendale, the wall papers and porcelains. Rather it drifted into political and commercial channels after Lord Macartney conducted the first diplomatic mission to China, although he did take two gardeners with him.

By 1812 Charles Claudius Loudon in "Hints on the Formation of Gardens" was concluding that natural landscape gardens were not for the small place and suggested more geometric styles. The naturalistic movement was well on the decline. The violent reformation of gardens brought its equally violent counterblast. Peacock's "Headlong Hall" pilloried it in 1815 and Scott's "Waverley" in 1824, and William Cobbett's "The English Garden" in 1835 awakened interest again in the formal garden. Once more terraces began appearing around great country houses and the times needed only the arrival of bedding-out, or mosaiculture, to give naturalism its congé.

Benefits of the Landscape School

Though the naturalists had gone in for the wholesale destruction of much ancient garden beauty, it is only fair to explain that they also made some definite contributions to the æsthetics of gardening and laid the foundations for several garden features existing today. The temple and the grotto find their respective progeny in the rustic summer-house and the rock garden. We may also thank them for a re-appraisal of the beauty of trees and for giving the first hints of the herbaceous border and the mixed shrub and tree planting.

During this era a great many kinds of foreign trees were introduced into England—West Indian and American trees of strange shapes and colourings. In the time of formal gardens, they were grown merely as curiosities, as botanical specimens, since they lacked the evenness of colour and capability of being clipped that were essential to the long avenues and stiff, high-in-air green walls of Queen Anne gardens. The naturalist would have shuddered at clipping trees. He used both native trees and shrubs and the new foreign introductions—just as an artist uses the varying tints on his palate—to afford a variation of foliage. Langley advised making mixed hedges of forest trees and fruits and added, "yet you must not forget a Place for those pleasant and delightful Flowering-Shrubs, the White Jessemine, Honey Suckle, and Sweet-Brier." Walpole explained that these foreign trees "contributed especially to the richness of colouring so peculiar to our modern landscape." What he said then could easily apply to any mixed shrub and tree planting found today. Variation in foliage, in manner of growth and flowering are the very elements we look for in the well-planned garden. For opening our eyes to this appreciation we have to thank the landscapists of 18th century England.

We can also find in their designs the germ of a favourite flower-planting method. A mixed planting of trees and shrubs with a few sturdy perennials at their feet constituted what these landscapists called "an elegant wilderness." It was the sort of naturalistic mixture of wildlings you find in a forest glade. True, these informal garden designers of the 18th century were not given overly much to flowers, and the styles, as they progressed, took flowers less and less into account. And yet Sir William Chambers did concede that one might have the indication of a walled garden "verged with a confused border of little shrubs and flowers." Nearly a century afterward, William Robinson, in his battle against bedding-out, proposed almost the same "confused border" under the name of the "herbaceous border."

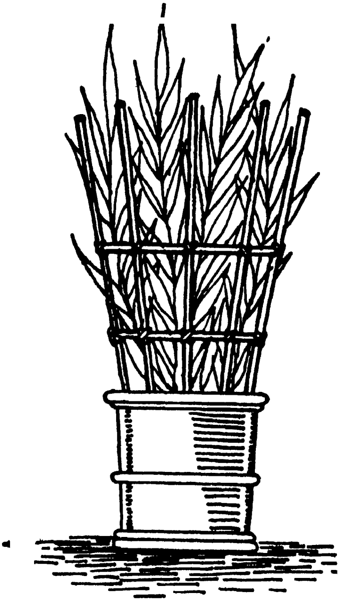
The Chelsea Physic Garden and Kew

While all this pother over the form of gardens was raging in England, distinct advancement was being made in the plants that eventually were to be grown in them. By exploration England was increasing her knowledge of the world's flora, and this knowledge was further spread by the many fine botanical works, illustrated with coloured plates, which began appearing in this era, and by books that were widely read—John Hill's "Eden" and the practical manuals of John Abercrombie and William Hanbury, and William Forsyth.

The two swirling centres of this interest were the Apothecaries' Garden at Chelsea and the newly formed Kew Gardens. We started the story of the former back in Chapter XI, now we pick up the threads.

In 1718 James Petiver, demonstrator of plants to the students, died after a fruitful life that included the assembling of a great natural history collection and the publishing of two large volumes with hundreds of engravings illustrating every branch of natural history. Four years later Dr. Hans Sloane bought and gave to the Apothecaries Company additional land which made the garden secure for all time. He died in 1753 and left his collections and books to the nation, thereby forming the nucleus of the British Museum. Philip Miller's Dictionary came out in 1731 and by 1732 he had sent to Georgia some packages of cotton seed destined to be the parent of all the plants from which three-fourths of the world's cotton is grown today. Thus the garden was beginning to exert an economic influence. Linnaeus visited it in 1736 and in 1748 Peter Kalm, another Swede, en route to America, stopped off there and was deeply impressed. In 1771 Miller died, aged 80, and was succeeded by William Forsyth, who later left to become royal superintendent of Kensington Gardens. His name is remembered each Spring when we see the Forsythia in bloom.

The next important influence in the garden's history came through Sir Joseph Banks (1743–1820). His interest in botany was dominant from youth. While an undergraduate at Oxford, he established a botany lectureship, and, once out of college, he headed for Newfoundland to collect plants and minerals. In 1768 he sailed with Captain Cook on the first of his memorable voyages. Banks had furnished the ship and a botanist and draftsman: finally he decided to go along himself, with Dr. Daniel Solander, who was later to serve as his librarian. The purpose of the voyage was to observe the transit of Venus from Tahiti for the Royal Society. The ship touched New Zealand and New South Wales. At each point Banks and Solander landed and collected plants. From the bush they gathered many treasures, including several eucalypti that Banks dubbed Gumtrees. At Botany Bay they collected a thousand species, in fact, gave the name to that bay because of their splendid finds. In New Zealand they collected three hundred species, the first from that country to be assembled. All the assistants of Banks and Solander died on this voyage, and the two leaders almost perished of fever in Java and their boat was almost lost in Queensland. Such were the perils undergone by these early plant explorers. After Banks returned from this trip in 1771, he went next to Iceland. Thereafter, until his death in 1820, he was the guiding genius of botany in England. Like Sloane, his books went to the British Museum.



POTTED PLANTS AND THEIR SUPPORTS WERE AN EARLY DIVERSION OF GARDENERS

Another interesting figure to appear was William Curtis, apothecary and botanist, who became demonstrator at the garden and wrote "Flora Londoniensis," regarding the flowers that grew within a ten-mile radius of London. He is also remembered for having started in 1787 *The Botanical Magazine,* a periodical which has continued uninterrupted down to our own day.

Such were the activities of the leaders at the Chelsea Physic

Garden in the 18th century, splendid activities that set the pattern for those who were to follow—John Lindley and Robert Fortune and others in the succeeding century. To the garden were sent countless packets of seeds and roots to be tried out, and from the garden went as many to the other botanical gardens of the world. Today the garden distributes over a thousand packages of seed a year and three thousand student attendances are recorded.

This interest in new plants was not confined to the Physic Garden by any means. Amateur botanists and plant collectors were as active in this century as before. Among them were Dr. James Sherard at Eltham, whose plant collection Dellenius described in 1732 in "Hortus Elthamensis"; and Peter Collinson (1694–1768), the Quaker London merchant, whose garden at Mill Hill had become a famous plant centre by the middle of the century. Collinson corresponded with all the leading botanists of his day, including John Bartram of Philadelphia, whose botanical journeys he helped underwrite. Due to Collinson's influence, Bartram was appointed Botanizer Royal for America. From every corner of the globe Collinson collected and imported seeds of new and unusual plants and, when they were at last growing, elicited the services of well-known botanists to name and classify them, such leaders as Dillenius, Professor of Botany at Oxford, Dr. Gronovius of Leyden and Dr. Solander, Linnaeus' favourite pupil. Collinson is believed to have introduced over forty American plants into English gardens. Another enthusiastic collector was the Quaker physician and philanthropist, Dr. John Fothergill (1712–1780) of Upton, near Stratford, whose garden at one time rivaled Kew. To these we should also add Robert Barclay of Bury Hill, Surrey, who studied botany, experimented in agriculture and further added to his fame by exchanging English fruits for Madagascar plants, which he introduced into English gardens. A fourth amateur botanist was Dr. William Pitcairn, who had his botanical garden of five acres at Islington. Nor should we forget the Earl of Bute, whose botanical collection in Bedfordshire was the envy of all. We shall keep these names in mind, for they were leaders in that botanical interest which was to result in the establishment of Kew.

Kew and Plant Explorers

On the death of the Prince of Wales, the Princess Augustus turned Kew over to the purposes of botanic study and investigation. The original nine acres were increased by George III in 1772. The Earl of Bute was made scientific adviser. On his death, Sir Joseph Banks became director, a post he held for forty-eight years. The botanical superintendence was entrusted to William Aiton (1731–1793), a pupil of Philip Miller. Aiton arranged the plants on the Linnæan system—there were from five to six thousand species—and in 1789 brought out a catalogue of them, "Hortus Kewensis." But the guiding genius was Banks. He it was who sent out the first professional plant hunter—Francis Masson (1741–1806), the father of a long line that extends down to our own day.

Masson was sent to the Cape in 1772 at the salary of $500 a year and with annual expenses limited to $1000. He travelled inland by ox cart and, from this first journey, sent back many specimens of ericas. The next year he went into the hinterland again, this time accompanied by Carl Peter Thunberg, one of Linnæus' pupils, and the following year the two returned for more plants. In all Masson collected some hundred new species. He then returned to England, and in 1776 Sir Joseph dispatched him to the West Indies. His collections from this trip were lost at sea. His next collecting field was South America, where he ranged from 1786 to 1795. Finally he came back to England, apparently to settle down, but the old wanderlust took hold of him and he headed for Canada. At Montreal he died obscurely in 1806. In addition to his great collections of heaths, Masson enriched the gardens at Kew with new cinerarias and pelargoniums.

On Captain Cook's third expedition, Kew sent along another of its gardeners—David Nelson. He reached Tasmania and explored for plants in 1771. Afterward he was on the ill-fated cruise of the *Bounty* with Captain Bligh, a cruise made for the purpose of introducing the breadfruit into the West Indies. Nelson died from exposure when the boat in which he and the captain, having been set adrift by the mutinous crew, finally touched land after having drifted three thousand miles. It remained for another to introduce the breadfruit—Christopher Smith, who planted the first trees in Jamaica, for which services the Jamaican Government rewarded him handsomely.

From various sections of the world new plants kept pouring into England—from China, Japan, Ceylon, the Caribbean, Australia and America. In this era—the date being 1764—England established its official first garden for the propagation of economic plants on the island of St. Vincent in the West Indies. This, however, had been preceded by the Trustees' Garden at Savannah. Other nations soon followed the custom—the Dutch in Java, the English in Calcutta and Ceylon.

Although by 1684 England had gotten a toe-hold on the China coast and surgeons of the East Indian Company sent back seeds of plants to Petiver and Leonard Plunkenet to try out and describe, the actual introduction of Chinese plants did not begin until early in the 18th century, when *Rosa Chinensis* and *Rosa semperflorens* appeared. By 1780 *Malus spectabilis* had arrived from China and nine years later the first Asiatic species of magnolias.

Another source of supply was the Near East. From 1702 to 1718 William Sherard, botanist, friend of John Ray and Sir Hans Sloane, was consul at Smyrna. He collected plants in Greece and Asia Minor and sent them home to his brother James, who tried them out in his garden down in Kent.

It has been estimated that of the eight thousand plants constituting the flora of the eastern United States and Canada, a scant half dozen were in cultivation in England before 1600. Then came the first settlements, and in fifty years the number had jumped to fifty; and by 1700, to one hundred and fifty. From then on it increased at a steady rate until its interruption by the Revolutionary War. Explorers had much to do with this increase.

The first plant explorer of note in America was John Clayton (1685–1773) who was on these shores in 1705. Together with Gronovins, he wrote "Flora Virginica," in 1739. He is remembered in that lovely little spring flower, the Claytonia. Three years later John Mitchell was publishing his treatise on the botany and zoology of the same state. Then came Mark Catesby (1679–1749) who also first collected in Virginia and was so successful that Sir Hans Sloane induced him to return to America. This he did, remaining seven years. In the famous catalogue gotten out by the Society of Gardeners were pictured several of Catesby's finds—*Begonia Americana,* the catalpa, the yellow-berried hawthorn, Carolina ash, tulip tree and scarlet flowered acacia, among them. In 1726, on his return, Catesby began writing his "Natural History of Carolina, Florida and the Bahama Islands." Published five years later, this is one of our most valuable items of Americana.

CHAPTER XIV

THE RISE OF GARDENING IN AMERICA

BY so many avenues may the Story of Gardening in 18th century America be approached that one is bewildered which to take. There's the story of fruit-growing, an industry into which the Colonies plunged at their beginnings. There's the evolution of formal gardens up and down the Atlantic seaboard. Or one might choose to follow some particular national group and trace the effect of its labours and cultural sources. The Dutch, the Huguenots—each offers a temptation. However, the outstanding feature of the rise of garden interest in America during this century was its scientific trend. Men were soon aware that the forests and meadows about them held a varied and interesting flora, which they both transplanted into their own gardens and brought to the world's attention.

Trailing this spread of botanical curiosity, eventually arose a desire for increasing the varieties of vegetables, flowers and fruits growable in the differing climates of this country. Improved economic conditions and safe living also made possible the building of fine houses and the laying out of distinguished gardens around them. Thus through the 18th century America ran the gamut of gardening experiences. Since botany appeared first, we shall start with those who pursued it.

Farmer and Gentleman Botanists

Long before New York dreamed of its potentialities or ever Boston held the cod sacred, Philadelphia was the centre of American learning and culture, and so it remained up to the threshold of the 19th century. There we naturally look to find the earliest botanists and botanical gardens.

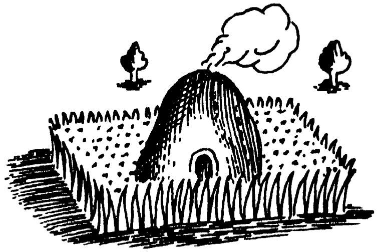
The honours for having the first of such gardens falls between Dr. Christopher Witt, the last of the Germantown Rosicrucian mystics, and John Bartram, the farmer-botanist from Darby. Witt had reached ninety when he died in 1765, and Bartram, who was twenty-four years younger, tells of visiting this garden and being aroused by its unusual specimens. However, Bartram's botanical leanings were apparent long before this, as he himself stated that since he was ten years old he had had "a great inclination to plants."

John Bartram (1699–1777), the ploughman who became a King's Botanist, started observations on his own farm near Darby. So insistent grew this curiosity about plants that, though he lacked both money and the sympathetic support of his wife, he gave up farm work, hired a man to do the ploughing and then went up to Philadelphia to plunge into botany in dead earnest. He bought books, which he could not read, so he paid a school teacher to instruct him in Latin. By the end of three months he had sufficiently mastered the Latin tongue to permit his reading Linnaeus, the Swedish systematist. With this equipment, he started scientific study of the plants in the immediate neighbourhood of his farm. Gradually he strayed farther. By the time he reached thirty, he had lost his first wife, acquired a second (who was much more tolerant of his botanical absences) and had purchased the farm near Philadelphia which he was to make into the first botanical garden in America. Here with his own hands he built his house, a house and garden to be for many years the centre of botanical culture of the American seaboard.

From then on—about 1731—he pursued his studies, made his many journeys, carried on a tireless correspondence with botanists at home and abroad, and both shipped and received a vast quantity of seeds, roots and herbarium specimens. One of Philadelphia's merchants, Joseph Breitnall, was agent for the London cloth factor and amateur botanist, Peter Collinson, and through him Bartram was first brought to Collinson's attention. For thirty-eight years they exchanged letters and plants. There were many others beside—Dr. Hans Sloane, Dr. John Fothergill, Philip Miller, Dr. Dillenius of Oxford, the explorer, Mark Catesby, the Dutch botanist, Gronovius, Queen Ulrica of Sweden; among the Americans were such gentleman-botanists as John Mitchell and John Clayton in Virginia, Cadwallader Colden in New York, Martha Daniel Logan of Savannah and Henry Laurens of Charleston, to name only a few. To Dillenius he sent a collection of American mosses and that botanist complimented him by naming a genus of them Bartramia. Many of these correspondents contributed, Philip Miller and Collinson especially, to the expenses of Bartram's trips. This correspondence alone was a monumental accomplishment, yet the basis for it was found in even more arduous and extensive journeys taken both alone and with his son, William, in search of the plants he described.

The distance covered on these botanical trips and the labours they entailed in wandering through areas untravellable save by blazed Indian trails, ranged from Lake Erie on the north to Florida on the south. Bartram kept a diary and sent copies of it to Collinson. Often he also mapped the areas. At Collinson's suggestion, George III appointed Bartram King's Botanist to

Florida, the peninsula England had recently taken over from the Spanish. In his sixty-seventh year, accompanied by his son, he made the journey down through the Carolinas and Georgia into Florida, a journey that would have taxed the energy and strength of even a man of much younger years. On this journey he discovered, on the Altamaha River in Georgia, the flowering shrub he named *Franklinia,* a wild species that only during the past few years has enjoyed intensive cultivation and distribution to our gardens.



AN AMERICAN INDIAN HOME, SHOWING THE FENCED GARDEN

This honour Bartram bestowed on Franklin was no mere perfunctory gesture toward a prominent official: Benjamin Franklin came honestly by his honours in botany. When, in 1743, he published his proposal to form an American Philosophical Society, he suggested that the study of plants be included in its labours. He also believed that the silk industry could be established in Pennsylvania, and to that end sent cuttings of mulberry trees from England to Philadelphia. He is likewise remembered as the first American to suggest the use of gypsum, or land plaster, for a fertilizer. Still further, he was the first to introduce broom corn into America.

To his garden Bartram brought back countless seeds and plants that he tried out, until it contained an amazing assortment. He also devoted much time there to the study of pollination, working with lychnis—the first American experiments in hybridizing and plant breeding. In this work John Bartram can lay claim to another distinction—he was the first to apply the Linnæan system in classifying plants. Gronovius had sent him a copy of Linnæus' "Systema Naturae" shortly after 1740. It is also pleasant to note that his fellow townsman, James Logan, sent all the way to England for the copy of Parkinson's "Herbal" that he gave to Bartram.

In his work both at home and in the field he was ably assisted by his son, William (1739–1823) who, after false starts in business and indigo raising, thereafter devoted himself to carrying on his father's work. While John Bartram published very little save a few fugitive scientific papers, a small journal account of a trip to western New York in 1743, and a preface to a materia medica, William is remembered for writing the memoirs of his father and his "Travels Through North and South Carolina, Georgia, East and West Florida, etc.," 1791, which later was translated into German and French. It was a landmark both in botany and ornithology, for, in addition to a great knowledge of plants, William's scientific investigations extended also to birds, and he was skilled in delineating them and other natural history subjects. During his life he had the opportunity of assisting on their way to fame two younger men—Dr. Benjamin Smith Barton, author of the first American treatise on botany, and Alexander Wilson, the itinerant weaver who became one of America's leading ornithologists.

Though John Bartram made up many herbarium specimens, some of which are still preserved in the Natural History Museum in London, his lasting contribution was in the living roots and seeds he introduced to England. He sent off his first shipment in 1734. From then on scarcely a boat left Philadelphia but carried its consignment from Bartram. Not alone did he send new plants, but he also collected and sent in quantity plants that were scarce in England. Among the first shipments was a skunk cabbage, and Collinson waxed enthusiastic over its beauty, despite its unpleasant odour. It is amusing to note that so late a botanist as Henri Correvon, in our own generation, cherishes it in his garden near Geneva as one of the most unusual of American plants.

It is impossible to figure exactly how many new varieties John Bartram introduced into England and the Continent, although it has been estimated between one hundred and fifty and two hundred. We do know that he sent to Collinson the following—honeysuckle, lilies, mountain laurel, dog-tooth violets, shooting star, wild asters, gentians, ginseng, sweet fern, magnolia, tulip- and locust-trees, hornbeam, spruce, hemlock, red and white cedar and seeds of sugar maple. In exchange, Collinson sent him twenty kinds of crocus, tulips, double sweet-brier roses, lilies, gladioli, iris, snapdragons, oriental poppies, carnations and daffodils. To the last item, the double narcissus, Bartram replied that they were too plentiful already from the offsets of the bulbs brought by early settlers.

Nor can we find exactly how many plants grew in Bartram's garden. For many years it was abandoned, abused and robbed, until the nurseryman, Thomas Meehan, in 1891, urged the city to obtain and preserve it. In the restoration that is now being accomplished from his notes, it will be an authentic plant museum of his travels and collecting.

The example set by Bartram aroused many to copy him. Around Philadelphia soon sprang up other botanical collections and the pursuit of botany therewith became a gentleman's hobby. To Woodlands, the William Hamilton homestead, in 1784 were brought the first gingkos and Lombardy poplars to flourish in America, and its grounds were constantly enriched by plants sent from all parts of the world. Twenty-five miles south of Philadelphia, at Marshallton, Bartram's cousin, Humphrey Marshall (1732–1801) like Bartram, built his house with his own hands, and established his arboretum. There he wrote the first American treatise on trees and shrubs composed by an American and printed here. This book, "Arbustum Americanum," appeared in 1785. It is pleasant to find that when the Russian botanist, Frederick Pursh, landed in America, Humphrey Marshall's garden was the first he visited. Marshall's neighbour, John Jackson, soon caught the plant collecting fever and laid out his finds at Londongrove. By 1800, at East Marlborough, the brothers Joshua and Samuel Pierce were assembling an impressive arboretum of evergreen and other forest trees. Twenty years pass, and down in Media, at the tender age of nineteen, Minshall Painter begins his collection of trees which eventually grew to six thousand specimens.

Another who advanced the cause of botany in Philadelphia was Adam Kuhn (1741–1817). Born in Germantown, he studied abroad under Linnæus and others, and on his return, in 1768, became Professor of Materia Medica in the College of Philadelphia, in which capacity he taught botany, perhaps the first to do so regularly in America. However, the first to hold a chair of botany and natural history was Benjamin Smith Barton at the University of Pennsylvania, who assumed that responsibility at the relatively tender age of twenty-four. To this position he brought learning and fame for twenty-six years, during which time he published, in 1799, "Fragments of Natural History of Pennsylvania," and later the book that gave him first rank, "Elements of Botany," 1803, the first of its kind in America. For this William Bartram drew the illustrations. Before this time, however, up at Harvard, Benjamin Waterhouse, Professor of Medicine, was lecturing on botany as early as 1768, although his lectures did not appear in print until a magazine produced them forty years later, and finally, in 1811, they were brought out in book form.

While this collegiate instruction in botany would have come eventually as the result of the demand for it, yet honour for suggesting it falls to a New England parson. In Ipswich, Mass., the Rev. Manasseh Cutler (1742–1823) wrote "An Account of Some Vegetable Productions Naturally Growing in This Part of America, Botanically Arranged," which was the first important description of the indigenous plants of New England. He also composed a botanical work that included the descriptions of three hundred and seventy plants. His interest in the subject induced him to suggest that botany be included in the curricula of our colleges.

Contemporary with Bartram were many gentlemen-botanists in other colonies. In New York the Lieutenant Governor, Cadwallader Colden, pursued scientific observations on his place near Newburgh-on-Hudson and down at Flushing on Long Island. He corresponded with the prominent botanists of the day and wrote extensively on scientific subjects, penning among other things a list of the plants growing in his neighbourhood, "Plantae Coldenhamiae" all set down solemnly in Latin, and being the first treatise on the flora of New York.

Colden's daughter, Jane, followed her father's interests and wrote the first local flora penned by an American woman. The credit for writing the first gardening book is usually accorded Mrs. Martha Daniel Logan of Charleston, for her "Gardener's Kalendar." No copy of her book is known to exist and we hear of it only through a re-publication in a magazine prior to 1798. Miss Colden's manuscript, which included many illustrations she made for it, has never been published. It is entitled "Flora Nov-Eboracensis," and was probably written about 1755, as her father mentions her doing this in a letter he wrote to Gronovius in October of that year. During the Revolution the manuscript fell into the hands of a Hessian officer who was interested in botany, and who, on his return home, carried it with him to Germany. Here it was preserved for some time at the university of Göttingen. From this Sir Joseph Banks purchased it, and gave it, together with his other books, to the British Museum on his death.

Other Pioneers in Gardening Lore

Each of these early American lovers of the green, growing world, as we pick them up, appears to have made some original contribution. Thus the Rev. Jared Eliot of Killingsworth, Conn., wrote, "Essays Upon Field Husbandry," 1748–9, and was the first to point out—a fact which many American gardeners have still to learn—that the differences in climate between England and New England make most English-written gardening books impractical here. Indeed, not until 1867, when Peter Henderson produced his "Gardening for Profit," can American horticultural experience be said to have freed itself entirely from foreign authority.

Husbandry was the favourite topic with some of these writers—Eleazer Phillip with his "Husbandman's Guide," 1710, and the Rev. Samuel Dean, Vice President of Bowdoin College, with his "New England Farmer or Georgical Dictionary," 1797.

Turning southward, we find a Scotch botanist, John Mitchell, settled near Richmond, Va., and writing a botanical dissertation as early as 1738. Three years later this was published in Nuremburg under the title "Novo Plantarum Genera." In Wilmington, Delaware, appeared a rare woman botanist, Rachel Barret; and down in Charleston two women were adding their bit to the Story of Gardening: Mrs. Mary Lamboll, who owned the first garden cultivated on a large scale there and well stocked with flowers and curiosities of Nature, and Mrs. Martha Daniel Logan who, although she was past seventy, was penning her "Gardener's Kalendar" and working many of her flowers on the outskirts of

ASA GRAY, 1810–1888

JOHN TORREY, 1796–1873

ANDREW JACKSON DOWNING, 1815–1852

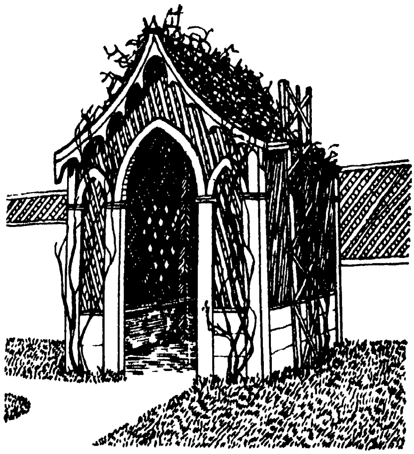
CHARLES SPRAGUE SARGENT, 1841–1927

FOUR AMERICAN BOTANISTS

THE OLD FLAGGED WALK IN THE FRANCHETTI GARDENS

THE NEW MANNER IN THE FLORENTINE GARDEN OF COLONEL AND MRS. KEPPEL the city. An earlier claimant to the calendar idea was the first book published in Georgia—the *South Carolina and Georgia Almanac*—for 1764, which contained a Gardener's Kalendar among its items of use and interest. However, tribute is paid to a Virginian for writing the first book on kitchen-gardening—"A Treatise on Gardening," by John Randolph, Jr., published in 1780.

At about the middle of the 18th century, Henry Laurens, leading citizen of Charleston, was introducing olives, capers, limes, ginger, Guinea grass, the alpine strawberry, red raspberries and blue grapes, and bringing from France apples, pears, plums and wine grapes. His garden was superintended by his wife, Elinor, assisted by a trained English gardener, John Watson. Watson was afterward to establish the first commercial nursery in the state. Another who gathered an interesting collection was the scholar and botanist Alexander Garden (1738–1791), who started a nursery on his place, Oranto, near Charleston, and corresponded with the leading botanists of his day. He is remembered in the Gardenia, which Linnæus named for him.



GOTHIC SUMMER-HOUSE IN A 19TH CENTURY AMERICAN GARDEN

Since early in its history Charleston attracted settlers from the West Indies, many tropical and sub-tropical plants soon appeared, and the great gardens that sprang up in and around the town were veritable botanical collections of both native and foreign flora—Charles Drayton's estate and William Williamson's being among the best known. By 1755 an English landscape architect was laying out Henry Middleton's place, and the following year the house was built. To these were brought the indescribable beauty of azaleas and camelias, flowering quince and wistaria and cherokee roses and jessamine and live oaks that have made those gardens along the Ashley River the most beautiful of their kind in the world.

Down on Charleston Neck, John Gibbes' garden could boast even a greenhouse—perhaps the first in America. This, together with his garden, was destroyed during the Revolution. It was near Charleston, also, that André Michaux, the famous French botanist, established the second of his collection nurseries. For a time Charleston also had a botanical garden, founded by the Charleston Botanical Society in 1805. At one time M. Noisette, who named the Noisette rose, was in charge of it. In 1807 John Drayton was publishing his book, "The Carolinian Florist," and the distinguished scientist, J. L. E. W. Shecut, his "Flora Carolinensis." Shecut was one of the moving spirits in the forming of the Charleston Museum in 1773, the first public museum in the country.

Thus, for many decades Charleston was second only to Philadelphia in its culture and gardening interests and number of amateur botanists. Even as late as 1828, a Charlestonian, Joel R. Poinsett was honoured when the scarlet-leafed plant of Mexico came to be named.

Skipping Georgia for the present, we can note that during this century Andrew Turnbull founded New Smyrna in Florida and thither brought fifteen hundred Greeks, Italians and Minorcans to produce sugar and indigo. Turnbull raised an orange that bore his name, and he encouraged the growing of such other tropical fruit as figs, pomegranates and olives.

In the settlement of Georgia we can view a pronounced gardening effort from the first, for the success of Georgia was predicated on its garden and farm products and allied industries. Plans for a public nursery were drawn up in England before the colony was established. At the time England was hoping that she might wrest the silk industry from France and was propagating the mulberry tree in quantity. Already it had appeared sporadically along the Atlantic seaboard; here in Savannah the founders planned to launch the industry in earnest. Not alone was each male inhabitant of full age to be allotted a five-acre garden plot and a farm of forty-four acres, but each was required to plant one hundred white mulberry trees. These were to be supplied by the trustees of the colony. To that end, there was laid out, by the order of Oglethorpe, in the spring of 1733, a public garden of ten acres, in which to make experiments for improving agriculture and increasing botanical knowledge. Here was planted a nursery of oranges, olives, white mulberries, figs, peaches and herbs, together with a collection of West Indian plants—coffee, cotton, allspice, cacao and bamboo. The Apothecaries' Garden at Chelsea contributed many plants. This Trustees' Garden, as it came to be known, was actually an economic garden, and in that respect it was the first in the world, as the establishment of the economic garden on the island of St. Vincent did not occur until thirty years later. The Trustees' Garden continued as a public institution up to the Revolutionary War.

Of all these country gentlemen and amateur botanists who pursued their hobbies in the 18th century, two appeal especially to the American imagination—George Washington and Thomas Jefferson.

Jefferson's scientific bent of mind was early evident and botany soon became a dominant diversion with him. He listed the native plants of Virginia and studied them carefully. He saw that American plants were sent to the Jardin des Plantes at Paris while he was in France, and from France and England he sent back home many new varieties. Monticello, the home he built on a Virginian mountain top, represents the epitome of his taste, which was a fastidious classicism. The gardens he made about it shared the same taste, although some believe that, in the disposition of its trees and shrubs, they can read the influence of the landscape school of English garden design, then so much in vogue.

In addition to being a great military leader, Washington represents the ideal of a farm hero, a country gentleman concerned with the improvement of his acres, living in a dignified manner in a noble house, surrounded by an unusual and well-planned garden. His diaries and correspondence attest to an unfailing interest in gardening and new plants, and the layout of the grounds around Mount Vernon are a living tribute to the high order of his taste. No one can read these documents or stroll through those box-lined gardens without being deeply impressed by the genuine interest this gentleman took in horticulture. He was a true Cincinnatus, and his hand returned to the plough when the sword could be laid aside, as quickly as he had abandoned the plough to assume the sword when his country needed him.

The Initial Nurserymen

While the first hint of an American nursery is contained in the record of John Endecott of Salem swapping five hundred apple-trees for two hundred and fifty acres of land way back in 1641, the American seed and nursery stock business did not get under way until well into the 18th century.

The first advertisement of seed is found in the *Boston Gazette* for February 28th, 1719, when Evan Davies offered "fresh garden seed of all sorts lately imported from London . . . as also English Sparrow Grass Roots, Carnation Layer, Dutch Goose-berry and Current-bushes." Thereafter in Philadelphia, New York and Boston papers advertisements of garden seeds appear quite regularly.

Although Daniel Engelman, florist and seedsman, started a nursery and garden shortly after he arrived in Philadelphia in 1759, the first establishment for the commercial growing of seed was begun in Philadelphia in the spring of 1784 by David Landreth, who had come from England three years before. First set in the heart of the city, it moved out to Bristol, Pa., in 1824, where it has since been located. David Landreth made the earliest collection of camellias and rhododendrons in America and his nursery carried an extensive stock of both native and foreign trees, shrubs and plants. His enthusiasm helped arouse gardening interest in and around Philadelphia, when it began to reassert itself after the Revolution. By 1832 the Landreth firm had begun its *Floral Magazine and Botanical Repository*. As foreigners came in, the Landreths strove to supply their wants—tomatoes, okra

DR. DAVID HOSACK S ELGIN BOTANICAL GARDENS, LOCATED WHERE RADIO CITY IS TODAY and artichokes for the French émigrés who flocked to Philadelphia during the French Revolution. Later on they introduced the cauliflower, eggplant and oysterplant and new varieties of rhubarb and sweet corn. From seed imported from Tripoli was grown the first cantaloupe.

Following the Landreths were still other seed establishments in Philadelphia—John Make-John's in 1792, William Leeson's in 1794 and Bernard McMahon's in 1800. Up in New York, in 1802, Grant Thorburn (1773–1863) started the seed and plant business that eventually extended to both Philadelphia and Boston. In a quaint autobiography Thorburn tells of how he stumbled on the beginning of this business inadvertently, by displaying a few potted plants in the windows of his general store. In 1821 he published his "The Gentleman and Gardener Kalendar."

While not so picturesque a character as Thorburn, McMahon (1775–1830) of Philadelphia served gardening nobly both by the extent of his seed collections and by his writing. His catalogue for 1804 lists a thousand species of herbs, shrubs and tree seeds. Some of these were of American plants, offered for the export trade; others were "Asiatic, South Sea Islands, African and European seeds of the most curious and rare kinds." McMahon published "The American Gardener's Calendar" in 1806. His store offered for sale a wide assortment of gardening and botanical books, and it soon became the rendezvous of Philadelphia gardeners and visiting botanists. His enthusiastic attachment to botany induced McMahon to help disseminate the novelties collected by the Lewis and Clark expedition to the Pacific. Thomas Nuttall in his "Genera of North American Plants," named the *Mahonia* for this seedsman.

By no means was McMahon's book the first American work on practical gardening. Two years before, there appeared "The American Gardener," by John Gardiner and David Hepburn, with instructions for the care and planting of flower gardens, vineyards, nurseries and hothouses.

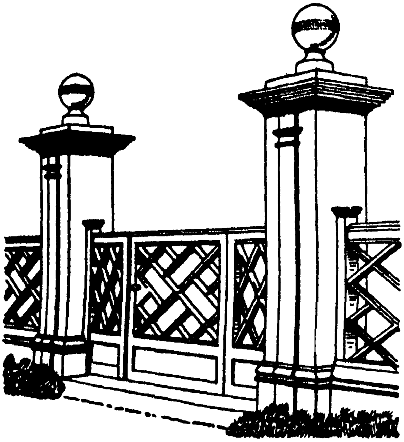
By 1730 Robert Prince had established his nursery at Flushing, Long Island, and from then on to the Revolution and afterward this Linnæan Botanic Garden became the most important in America. Four successive generations of Princes managed it. Fruit was the first main crop and the catalogue eventually included every hardy variety available in America and England. In 1771 the nursery was offering twenty-nine budded sorts of peaches. Under William Prince of the third generation, the organization reached the apex of its fame—new varieties of fruit were bred, of which some are still grown. In 1828, for instance, one hundred and forty kind of plums alone were listed. In the fourth generation Robert William Prince assisted in the important botanical survey of the Atlantic States made by Professors Torrey and Nuttall. The Princes also had books to their credit—in 1828 William Prince wrote on New York fruits and two years later William Robert Prince published "A Treatise on the Vine." Together they brought out the "Pomological Manual," in 1831.

The extent of these early orchards can be gathered from that of Thomas Young at Oyster Bay, L. I., which in 1768 was awarded a prize of £10 by the Society for the Promotion of Arts for the largest number of trees growing in nursery rows—he had twenty-seven thousand!

Up in Newton, Mass., in 1790, John Kenrick established a nursery for growing peach-trees. With a more extensive array of trees, shrubs and plants, it continued operations until 1870.

A third important nursery was begun by William A. Coxe at Burlington, N. J., in 1806, an establishment that contributed nobly to the advancement of American pomology. Coxe's "A View of the Cultivation of Fruit Trees" was the first of its kind written by a native son.

A practical work, based on indigenous experience, Coxe's book marked a distinct step forward in American fruit-growing. This commerce had begun early and soon became one of the most important in the country. New England had supplied apples to the West Indies before 1741. A few years later, when American-grown apples appeared in London, they so appealed to the English taste that Bartram was soon shipping over wood of American apple-trees for grafting. By 1821, the apple export alone had reached seventy thousand barrels. The peach, too, began to become a commercial product. In 1800, James Robinson, near Baltimore, began setting out the twenty thousand trees that were to form our first large commercial peach orchard. Its fruit was mainly used for distillation into peach brandy. Not until 1840, however, was the American Pomological Society formed. By then William Coxe was sleeping in his grave—but amateur and commercial growers of fruit alike were still consulting his book or dipping into James Thatcher's "American Orchardist" that appeared in 1822.



AN 18TH CENTURY GATE AND FENCE AT THE LONGFELLOW HOUSE, CAMBRIDGE, MASS.

Up to this point we have mentioned occasional volumes by American-born authorities as being the first of their kind written here. Before the Revolutionary War most of the books consulted were of British origin. Many continued to be imported after peace, some of them with American notes. The latter type was represented by the 1799 American edition of the Rev. Charles Marshall's "Introduction to the Knowledge and Practice of Gardening," a popular English work. Another was the 1802 American edition of William Forsyth's "Treatise on the Culture and Management of Fruit Trees," that William Cobbett edited. Cobbett himself wrote "The American Gardener," in 1819. At the same time the tide of American-written books began creeping in. Two more decades saw them flowing freely.

Six Untiring Botanical Travellers

From the very beginning, these nurseries and private botanical gardens were enriched by the plants accumulated by plant explorers. America was a happy hunting ground of the botanist throughout the century, for, in addition to the travels of John Bartram and the later explorations of his son, William, the Atlantic States were traversed by many professional plant hunters. In succession they were Peter Kalm (1715–1779), André Michaux (1746–1802), Frederick Pursh (1774–1820), G. H. E. Muhlenberg (1753–1815), Thomas Nuttall (1786–1859) and David Douglas (1798–1834), to name only six of the concourse. Each of these made such outstanding contributions to our gardens and knowledge of plants that they demand more than mere mention by name.

Peter Kalm, whom we remember in the Kalmia, or mountain laurel, that lovely, spring-flowering, broad-leaf evergreen, was one of Linnæus' outstanding pupils. That great Swedish botanist, as we shall see in the next chapter, sent his pupils all over the face

Between 1753 and 1761 he was writing his "Voyage to North America," which contained the results of his observations on American plants, soils and other natural features. This was translated into English in 1772.

The range of André Michaux's life may be gathered from the fact that he was born near Versailles and died in Madagascar. After studying botany, he made botanical journeys over Europe and even penetrated Asia. Returning from Asia in 1785, he was sent to America by the French Government to establish a nursery near New York, where he was to cultivate trees and shrubs that he would afterward send to France so that they might be naturalized at Rambouillet. An advertisement in a New York newspaper for April 14, 1786, apprised the populace that, "Mr. Michaux, Botanist to His Most Christian Majesty, having purchased a lot of ground at Wehocken near the Three Pidgeons, is erecting a garden there, which for magnificence, etc., will exceed anything of the kind in America. In it he will introduce many exotics and domestic botanical curiosities." The nursery begun, he started on his travels—through New Jersey, Pennsylvania and Maryland—and dispatched his first shipment of plants to France. The following year he established another nursery near Charleston, then took to exploring the Savannah River, the Alleghenies, Florida and on down to the Bahamas. In 1792 he started on a journey with Hudson Bay as its objective. When he reached Lake Mistissinny, his guides refused to go farther and the expedition had to be abandoned. He next made a long and difficult survey of Kentucky. Finally in 1796 he sailed for France with a collection of plants. Off the coast of Holland the vessel was wrecked, but Michaux saved his collections.

In those eleven years he had been in America he had covered more ground than any other plant explorer, and his two nurseries had enriched the gardens of their respective localities. The destruction of his garden at Rambouillet, his efforts to revive it, his expedition to New Holland and the nursery he tried to establish at Madagascar, when fever took him off, need not enter this story. His one book was "Histoire des Chênes de l'Amérique Septentrionale," 1801.

In the advancement of American botany he was an indefatigable worker, and he handed on to his son, François André, a heritage that this young man strove nobly to carry on. For after the turn of the century, this second Michaux was sent to America by the French Government to study the forests his father had explored. He also travelled over a greater part of the United States and left the world richer by his writing on it. "Voyage l'Ouest des Monts Alléghanys" appeared in 1804, with an English translation the following year. His observations of the trees of America are contained in "Historie des Arbes Forestiers de l'Amérique du Nord," 1810–13, which was Englished four years later as "The North American Sylva," a work that Thomas Nuttall increased by three volumes thirty years later.

America was early a melting pot of botanists. Kalm was a Swede, Michaux a Frenchman, and the next under consideration was a Russian. Frederick Pursh was born in Tobolsk, Siberia, of German parents. Educated at Dresden, he came to Philadelphia the West Indies. In 1807 he took charge of Dr. Hosack's newly established Elgin Botanical Garden in New York. Many of the plants from the Lewis and Clark expedition came under his care. In 1814 he produced a monumental work in eleven volumes, "Flora Americana Septentrionalis." Finally he died in Montreal in 1820. A fairly full life for forty-six years!

The Lutheran pastor, Gottrif Heinrich Ernst Muhlenberg (1753–1815), stands as an example of those clergyman, found in all ages and countries, who pursue the study of botany and increase our knowledge of plants by their endeavours. Accompanied by Dr. Johann David Schoff, a Hessian stationed in New York during the Revolutionary War, he travelled the Atlantic States in search of medicinal plants, and with Schoff wrote an American materia medica in 1787. His catalogue of plants was published in 1813. Among botanists he was one of the most ardent correspondents, writing especially to his religious brethren in distant parts of the country. He is remembered by gardeners in several genera, notably in the golden rod, *Solidago Muhlenbergiana,* and by historians of botany through the fact that when his "Catalogus" was reprinted, in 1818, it was rearranged after the system of Jussieu, the first attempt in the United States to group plants by the natural method.

The story of Thomas Nuttall is rich in romance. It is the story of a printer's devil who became a Harvard professor, which even non-Harvard men will concede was a step up in life. Having learned the printing trade in England, at twenty-two he came to America and in Philadelphia fell under the influence of Dr. Benjamin S. Barton, who persuaded him to study natural history. Thereafter botany and ornithology were his chief interests, and in pursuing them he travelled vast distances—through all the States of the Union including the everglades of Florida, the prairies of Arkansas, the Pacific coast, and thence on to the Sandwich Islands. In 1822 he became Professor of Natural History in Harvard and curator of the botanical gardens there, positions he held until 1828, when he retired to England. Nuttall's writings were many and valuable: "The Genera of North American Plants and a Catalogue of the Species to 1817," 1818; "A Journal of Travels into the Arkansas Territory during the Year 1819," 1821; "Manual of the Ornithology of the United States and Canada," 1832; and the three volumes he added to François André Michaux's "North American Sylva."

Into a life of only thirty-six years David Douglas packed more than most men do in seventy. A Scotch lad, he worked first in the botanic garden of the University of Glasgow, where he caught the attention of Dr. William Hooker, and at his suggestion was sent as a botanical collector to the United States by the Horticultural Society of London. He was about twenty-five at the time. His travels extended as far as Oregon and California, he explored the Columbia River and covered the continent from Fort Vancouver to Hudson Bay. He made a second visit to the Columbia River in 1829, and then on to the Hawaiian Islands, where he was killed by falling into a pit. Of the California flora alone he collected and brought back to England over eight hundred specimens. We may well say that the English interest in the flowers of California which, alas, exceeds interest in those flowers displayed by gardeners on the Atlantic seaboard, dates from the return of David Douglas from his wanderings. In any event, wherever it grows, gardeners remember him in the Douglas Pine.

Two Collegiate Botanic Gardens

During the course of outlining the careers of the six botanical explorers, mention has been made of two collegiate botanical gardens—Harvard and the Elgin Botanical Garden in New York. Harvard came first.

By 1792 Massachusetts had formed its Society for Promoting Horticulture, and among the commendable works it instituted was the establishment at Harvard of a Professorship of Natural History. This was followed by an agitation for a botanical garden, and in 1805 a plot of seven acres was laid out, with the society as one of its chief supporters. It was located in Cambridge at the intersection of (perhaps by intention!) Linnæus and Garden Streets! Thomas Nuttall was made director, the first of a long line of prominent botanists who have been in charge down to our own day. In addition to acting as a class room for students, this garden also distributed new and unusual plants to the members of the society. Thus it early influenced the spread of interest in horticulture, which ultimately resulted in the founding of the Massachusetts Horticultural Society and the laying out of so many well-stocked gardens in the neighbourhood of Boston.

As Professor of Materia Medica in Columbia College, David Hosack (1769–1835) faced the problem that his students had no garden in which to study the plants on which he lectured. Nor could New York, already beginning to display those economic and geographical advantages that promised to make it a metropolis, count any such botanical garden among its features. To supply these wants, Dr. Hosack, being a man of means, obtained from the city twenty acres on which is now Fifth Avenue. The year was 1801. Here he started planting the grounds and erecting the necessary buildings. Between what are now 50th and 51st Streets, he erected combined greenhouses and hothouses with a frontage of one hundred and eighty feet, in which were also contained rooms for scientific meetings. By 1806, when Hosack published its first catalogue, the garden contained two thousand plants. The property was surrounded by a stone wall seven feet high. Frederick Pursh was made curator and here he identified much of the Lewis and Clark plant material.

Hosack hoped that his garden would eventually contain all varieties of fruit trees and shrubs, table vegetables, medicinal herbs, rare ornamental plants and a surrounding belt of forest trees. He dreamed of a building in which could be housed a lecture room, library and herbarium, and that the garden would provide courses in the technique of horticulture and the art of landscape gardening, as Kent and Langley and Brown and Repton were developing it in England. Into this garden Hosack put over $100,000 of his own funds. Some of his dreams were accomplished. The garden attracted such important botanists as Michaux, William Bartram, Doughty, Pursh and Le Conte, and Hosack's two students, Gray and Torrey, who were to make such splendid contributions to botanical science in their time.

Hosack had a country estate of seven hundred acres at Hyde Park-on-Hudson that he developed into one of the most attractive show places in the country, with a wooded park in the contemporary English style, and a full complement of greenhouses, hothouses, shrubberies and flower and kitchen gardens. Between this and the Elgin Garden, as he called his New York venture, his purse was taxed more than it could stand. He was obliged to ask for

State aid, and that assistance was grudgingly and slowly given. The gardens, consequently, were neglected, and the land eventually passed into the control of Columbia University in 1814.

Though David Hosack's dream was never entirely fulfilled, a contribution to his memory has been made by Rockefeller Center, which now occupies the grounds of the Elgin Gardens—the roofs of the buildings have been covered with planting and the tallest of them is an evergreen garden that, without doubt, is the highest hanging garden in the world. A long, long way from those Hanging Gardens Nebuchadrezzar made at Babylon to satisfy his homesick Median bride! A long, long way, too, from the neat botanical plots of David Hosack!

Early Societies and Magazines

Fifty-five years after the first London Society of Gardeners produced its initial catalogue, twenty-three estate owners, prominent citizens and botanists of Philadelphia were forming the first organization of its kind in the United States—the Philadelphia Society for Promoting Agriculture. The year was 1785. In the same year was founded the South Carolina Society for Promoting and Improving Agriculture and other Rural Concerns, an organization that ten years later was named the Agricultural Society of South Carolina. It still exists. In 1792 New York formed its Society for the Promotion of Agriculture, Arts and Manufactures. The next year, as we have seen before, the Massachusetts Society for Promoting Agriculture came into being. By 1818 was begun the New York Horticultural Society, in 1827 the Pennsylvania Horticultural Society and in 1829 the Massachusetts Horticultural Society. The latter two still thrive; the New York society staggered through nineteen years and then died. Somehow, New York has

MODERN GERMAN VERSION OF A ROCK GARDEN WITH A POOL

THE ROMAN PERGOLA APPEARS IN A MODERN GERMAN GARDEN

CACTUS AS GROWN IN A CALIFORNIA GARDEN

CACTUS AS GROWN FOR DECORATION INDOORS

been unfortunate with its horticultural societies until the third and present organization came into being. By 1828 Geneva, New York, had its Domestic Horticultural Society and the following year Albany started one. Others followed in quick succession in Baltimore, Quebec, Charleston, Washington and New Haven.

These early organizations, it will be noted, were devoted more to the interests of the farm than of the garden. Horticulture for pleasure, that "elegant branch of husbandry," as Robert Livington dubbed it, had to wait in the United States until the first quarter of the 19th century was well advanced.

The same applies to the magazines. *The Massachusetts Agricultural Repository,* first issued in 1793 by the Massachusetts society appeared as the initial specialized paper of its class. Then, in 1819 came the *American Farmer* of Baltimore, followed by the *New England Farmer* of Boston in 1822—an outgrowth of the *Massachusetts Agricultural Repository*—the *New York Farmer,* 1827, and the *Southern Agriculturist,* established in Charleston in 1828. In these publications only a small space was devoted to horticulture. Gardening, either for pleasure or to provide the table, was not sufficiently widespread to support a paper of its own. Not until the 30's were there attempted any publications devoted to gardening alone. The Landreths of Philadelphia were the first to take the venture with their *Floral Magazine and Botanical Repository* in 1832. The following year came the *Ladies Horticultural Magazine and Floral Register* and, in 1834, the *Magazine of Gardening and Botany,* both monthlies and both published in Baltimore.

Roused to the commercial possibilities of such publications (these were boom times, incidentally) Boston began three of them in quick succession in 1835—the *Horticultural Register and Gardener's Magazine,* edited by Thomas G. Fessenden; which ran a brief four years; the *Gardener's Magazine,* edited by Joseph Breck, which succumbed in three; and the *American Gardener's Magazine,* which in 1837 changed its name to the *Magazine of Horticulture and Botany,* edited by C. M. Hovey. It outstripped the others by lasting thirty-three years, until 1868. Meantime out in Cincinnati, Hooper and Elliott produced the *Western Farmer and Gardener* in 1839, which lasted exactly six years. In 1844 a quarterly, Hoppy's *Orchardist's Companion,* was begun, and in 1845 the interest in fruit-growing encouraged Charles W. Elliott of Cincinnati to begin a bi-monthly, the *Pomological Magazine.* By July 1846, Andrew Jackson Downing, of Newburgh, N. Y., began disputing the power of Hovey's *Magazine of Horticulture* by bringing out the *Horticulturist,* which he edited until his tragic death by drowning in 1852.

So much for the beginning of America's gardening periodicals: they came into being through a demand for them, and they faded out when the interest fagged. Unless subsidized by an idealistic publisher or supported by society memberships, no purely horticultural magazine has ever been able to do more than exist in the United States; none of them ever make much money for their proprietors. Nor has any publisher ever been so rash as to attempt a penny gardening paper of the type so popular in England today.

The Beginning of Flower Shows, Fairs and Experiment Stations

The flower show came as a natural consequent on the forming of horticultural societies. These organizations had frankly been based on the scheme of the London Horticultural Society, founded in 1804. To monthly meetings the members brought new and unusual examples of their horticultural skill. The first American public exhibition was held in June 1829, in Philadelphia, at Masonic Hall, under the auspices of the Pennsylvania Horticultural Society. By 1832 this had become an annual affair. Boston's exhibitions started also as private showings by and for members, but the public were not admitted until some time later. A further study of flower shows will come when we reach the 20th century. Here we must find space to sketch the rise of the county fair, that peculiarly American institution, because out of it sprang two public services most beneficent to gardeners.

Weekly or monthly market fairs for the sale of farm produce were common as far back as the earliest days of Rome. Within sixteen years after its settlement, New Amsterdam held *its fair,* and legislation was soon enacted to control the sales. The American agricultural fair was first conceived by Elkanah Watson (1758–1842) and the first of them was held in Berkshire County, Mass., in 1811. The idea ran through the country like wild-fire. Watson wrote a history of this fair system in 1820, in which he *made many suggestions. Among them he proposed a national* Department *of Agriculture.* George Washington *had first* suggested the idea, but nothing came of it until Watson began agitating. In 1839 Congress timidly supported the suggestion with a $1000 appropriation—and the venture was started.

Watson also suggested that each county support a model farm on which up-to-date methods of husbandry and agriculture would be pursued, where there would be conducted demonstration raising of trees, plants and shrubs and where new plants could be acclimatized. From this suggestion eventually grew the modern Experiment Station and Agricultural College, which so ably serve farmer and gardener alike today.

The Form of Eighteenth Century American Gardens

When in 1773, under the patronage of the English Dr. Fothergill, William Bartram started his exploration of Florida, Georgia and the Carolinas, a journey that was to continue for the next five years, he noted definite interest in gardening affairs. In Alabama he observed apple-trees the French had planted and fruit being well grown near New Orleans, and at Baton Rouge a garden of exotics that included the tuberose.

Except here and there, where the owner of the garden was an amateur botanist, no great variety of plant material was found. The potato was not well grown nor grown in good varieties. Tomatoes were considered poisonous and raised only for decoration. Lilacs, roses, snowballs, lilies, pinks, tulips, sunflowers, hollyhocks and such other annuals marked the horticultural ambition of the ordinary gardener. He shaded his arbours with morning-glories and gourds. The average garden was utilitarian; no especial effort was made at embellishment.

The big estate was a different matter. Their owners, like as not, had travelled abroad and seen the famous gardens of England and the Continent. Many were students of English and French gardening books. Some imported foreign-trained gardeners to assist in laying out and maintaining their places. All of them displayed that pride and interest in the land which was the commendable virtue of the English landed gentleman, and many of them, copying their fellows across the sea, took a keen interest in the designing of the gardens on their estates. They were gentleman-landscapers just as they were gentleman-architects.

While not a few of these gardens were made before the Revolution, the majority of those which we see today were produced afterward. Not until the late 18th century was box—that essential factor of American formal gardens—introduced in quantity. Many of the so-called "ancient" box gardens of New England and the Southern States actually date from after 1800.

That same date saw the first extant hothouse built in New England for the cultivation of such tropical exotics as pineapples, bananas and mimosa. It was erected on the estate of Theodore Lyman at Waltham, Mass., and is still used. So also is extant one of our earliest orangeries, which was erected at Wye in Maryland shortly after the Revolution.

The style these 18th century estates followed was the formal patterned style of English gardens before the landscape movement began to change them. America echoed England's lingering formalism. In those decades between the end of the Revolution and 1830, some of the most notable estate gardens were laid out. Those that remain today bear witness to the splendid taste of their owners, and to their constant desire to grow new plants.

Whereas, for the first century and a half America was shipping its newly found plants to England and the Continent, by the first quarter of the 19th century, American horticultural societies were importing the newly found plants of Asia and other distant lands for distribution among their members. These were grown for their horticultural interest alone and did not affect the form that gardens took.

Although by the turn of the 19th century England was beginning to revolt against the landscaping furore of "Capability" Brown and Batty Langley and Humphrey Repton and the oriental fantasies of Sir William Chambers, and was definitely turning on the old style of formal garden a more favourable eye, America had not even ventured to try the naturalistic style to any extent. Thomas Jefferson may have been swayed by it when he considered the grounds of Monticello, and David Hosack when he planted his estate at Hyde Park, yet not until the decade before the Civil War, when Andrew Jackson Downing began preaching it, did Americans feel impelled to copy the naturalistic landscaping of England. The formal garden lingered for a long time in America.

Nor was the influence in gardening taste altogether limited to an English source. In some areas of the Atlantic seaboard French influence could be traced. In the Southwest and along the Pacific coast the Spanish were laying the foundations of a permanent influence.

Fr. Junipero Serra, in 1769, established his mission at San Diego, and within a few years twenty-one mission stations in all were planted along the Pacific coast. Serra brought along the olive, pomegranate, fig, lemon, orange, apple, pear, peach and wine grape. In 1770 he planted date palm seeds. By the beginning of the 19th century the San Diego mission was cultivating two hundred fruit trees. At these missions the native Indians were taught handicrafts and better agricultural and horticultural methods. Moreover the mission buildings themselves were to bear an effect. Built of adobe by local labour, they set the style for architecture in California. Today the mission style of home and the Spanish type of garden to surround it have become commonplace on the Pacific Coast.

The French settlements at New Orleans, Quebec, and along the Mississippi, apart from growing excellent fruit and a few exotics, cannot be said to have affected American garden culture. Such French influence as did make itself felt crept in by other channels. Whereas the English landscape school was slow in crossing the Atlantic, its French counterpart, the rococo taste, did manage to land here safely.

The philosophy of that prophet of Nature, Jean Jacques Rousseau, of Voltaire and the Chinoiserie of the rococo era, which appeared in France in the 18th century, found sympathetic listeners here. More than one lady of quality had sighed longingly when she read of the rural delights of Julie in "La Nouvelle Héloïse," and many a citizen nodded sagely at the naturalism of Voltaire. Occasionally one could find a discreetly rococo summer-house. Moreover, there were rumours of the remote and fabulous elegance of the East, for to ports along the coast, came home clipper-ship men, fresh from Chinese waters, bearing their own souvenirs of the Orient from which this new French taste had sprung.

These, of course, were merely faint echoes of garden thought and taste that had reached dominant proportions in France and other countries of the Continent. We must turn, now, to that area to watch their evolution in the 18th century.

CHAPTER XV

THE EIGHTEENTH CENTURY IN FRANCE AND ON THE CONTINENT

MORE than once, along the trails of gardening evolution, we have encountered missionaries—those that took the Buddhist grove to India and China, those that brought exquisite landscaping to Japan, those that carried fruit to distant corners of America—and now, in the opening of the 18th century in France, we encounter them again. In order to realize why they bore the influence they did on gardening taste, we have to understand something of why they were in their mission fields and why the messages they sent back meant so much to those at home.

Curiosity About China

By the opening of the 18th century, England and the Continent had begun to develop a lively curiosity about China. The race for trade had started, and in this race ran many kinds of men. Successive attempts to plant Christianity in China had met with rebuffs until the Jesuits, themselves none too popular in Europe at the time, hit on the idea of ingratiating themselves by being more than preachers and proselytisers: they trained their candidates in the useful arts and sciences until they were in demand. Just as Soviet Russia imported brains for the development of its Five Year Plan—engineers from England, Germany and

America—so did China import these priests. Thus it came about that when the Chinese emperor wanted an astronomical station set up at his capital, he employed Jesuits. And when Ch'en Lung aspired to have a new palace built, he welcomed Frs. Attiret and Castiglione, who were equipped to paint family portraits and murals for it.

After the manner of Jesuits everywhere, these priests sent back home reports of the country in which they laboured, and the custom soon became widely practised by all types of missionaries. These reports not alone brought news of what Chinese gardens were like, but, in later ages, their authors began bringing to the gardens of the world the rare plants of China. Among the first of these priestly plant explorers was Fr. d'Incarville, whose contributions will be discussed later on in this chapter. To France especially, this news from an outlandish country was welcome. Wallowing in the doldrums of defeat and decline, France snatched this fresh influence eagerly.

So long as Le Brun lived, he maintained his dictatorship of taste in France. It was the taste that had brought about the glories of Versailles and Marly and St. Cloud. Le Brun died in 1690. Le Nôtre died in 1700 and his nephew succeeded him as superintendent of the royal gardens. Quickly the Court took up the new style—the first New Year's Day of the 18th century was celebrated with Chinese festivities. Fifteen years later, Louis XIV, his glory badly eclipsed, passed into time. Though it wept him, the Court could sigh with relief. Already many of the landed gentry who had clustered around the Court, were sent scuttling back to their country estates. Those that remained in and around Paris began to yawn behind their hands when Versailles was mentioned. Its formalism, its vast reaches, bored them. Some even were inclined to agree with the English Lord Kames, that "Versailles is a monument of depraved taste."

Nor were the times any too good. A dark cloud of depression was settling over France. Out in the country the aristocracy, unlike the aristocracy of England, regarded agriculture with indifference. They made no effort to enlighten the ignorant peasantry or to institute improved processes. Indeed, interest in the land did not awaken until the middle of the century when, rousing itself, the aristocracy of France suddenly made agriculture fashionable.

Depression and a New Taste

Those who dwelt in cities and towns were equally dispirited by the depression. They were probably tired out by the strenuous period through which they had just passed. Their curiosity, however, found satisfaction in news that was coming from China. Besides, many of them—including Cardinal Mazarin and Pompadour—owned stock in the Compagnie des Indes and hoped for rich returns on their investment. Consequently, when the Jesuit missionary Louis Le Comte, who had left France in 1685 and wrote of that country in 1699, reported on gardens, they awoke with smiles. The Chinese delighted in their gardens, Le Comte said, "and are at some cost about them; they make grottos in them, make pretty little artificial eminences, transport thither by pieces whole rocks, which they heap one upon another, without any further design than to imitate Nature." Into this report the enthusiastic rock gardener of today might read the beginning of his hobby.

However, the French had not long to wait for more news. Fr. Attiret, returned from China, published his "Lettres Edifiantes et Curieuses." His commission in China, after all, had been a strange one. The missionaries had not alone brought Chinese taste to Europe, but European taste to China, and Yuan-ming-yuan, the new palace they designed for the imperial grounds of Ch'en Lung, was in the Chinese-European style. Castiglione, Attiret's partner, had even learned to paint in the Chinese manner. While working on this commission the two Jesuits had been allowed to stroll, carefully guarded, through the imperial gardens, and from these observations Attiret wrote his letters.

It is important to remember the European aspects of this Chinese taste, for what the French elected to use was not the entirety of the Chinese style—not its grandeur and stateliness, but the more whimsical aspects that served as a relief to the disenchanted nobility. Out of these foreign whimsies they fashioned themselves a new world in which to live, a world entirely different from the grand manner of Louis XIV and Le Nôtre and Le Brun, a world fantastic and delicate and gay.

These were the circumstances that brought about the rococo taste in gardens, a taste that reigned supreme in France for fifty years, until archæological discoveries at Pompeii brought about the revival of classicism that overcame it in the last quarter of the century.

France, which had prided itself in the vast extent and glories of Versailles, learned from Fr. Attiret of a garden so large that Versailles would have rattled around in it. What were the Grand Palace and the Trianons compared with the two hundred palaces of Ch'en Lung? Or the Grand Canal, with his artificially made lakes—one of them having five miles of shore line and a central rock on which was built a palace containing a hundred different apartments? And how sparse and severe seemed those Versailles bosquets and prim little patterns of flowers compared with the unbelievable abundance of flowers and the thousands of flowering trees and shrubs growing naturally in that garden at Peking!

This was a purely naturalistic garden Attiret described, a garden of raised hills and little valleys and streams and lakes and rivers. One stream was so large that it would accommodate a boat seventy-eight feet long! Scattered along the turning and winding paths were charming pavilions and grottos, each with its own grounds different from the others. The pleasure palaces were "gilded, painted and varnished," and had red, yellow, blue, green and purple roof tiles. The stream sides were planted with trees and shrubs in a rude and rustic manner and the rock-strewn banks were "sprinkled with flowers, which rise up even through the hollows in the rock-work as if they had been produced there naturally. They have a great variety of them for every season of the year." Over the streams were thrown meandering bridges—some of them forty feet long—high enough for boats to pass beneath, and they were "fenced with ballisters finely wrought and adorned with works in relievo." And at the ends or in the middle were little pavilions "for people to rest themselves in." Forest trees and flowering trees were mingled together on the hill-sides, some of them native and some brought from foreign lands.

Attiret closes his account by stating that "this is not the only one that belongs to the Emperor: he has three others." The French Court, reading of such glories, realized that Louis XIV's Trianon de Porcelaine—the first to show Chinese influence in France—had been a mere bagatelle.

Consequently when Saint Simon began attacking the formality of Versailles and Marc Antoine Laugier in his "Essai sur l'Architecture," 1753, suggested that the Chinese style be fused with Le Nôtre's, the notion fell on sympathetic ears. Although Hubert Robert was commissioned, to make some restorations at Versailles, he saw to it that the place assumed an even more dilapidated air than neglect had already given it.

This atmosphere of ruins and neglect can readily be attributed to the popular artists of the time—Fragonard, Watteau, Le Prince, Joseph Vernet and Hubert Robert. The principal subjects were scenes of ruins and of ladies in swings being tossed aloft by gallants in gardens that sorely needed attention. Love among the ruins, some one has dubbed the spirit of these times. Robert came by his taste honestly—he had studied painting in Rome for ten years. Prince and Fragonard had also studied there. Of this group Robert was the leader and the one who, in addition to painting canvases full of capricious disorder and negligence in the manner of Italian ruins, also actually planned and executed gardens. He worked at Ermenonville and Rambouillet.

The Chinese naturalism about which Attiret had written was received sympathetically for several other reasons. The rustic garden of England was introduced into France through poetry and literature and the camaraderie between the upper classes of each country. Today our labouring classes enjoy an international camaraderie; in the 18th century it was the aristocracy of France and England that visited back and forth after the peace of 1762. Consequently, they were acquainted with what was being done to gardens and the trends of thought that brought these changes about.

French philosophers, too, visited England. Voltaire lived there from 1726 to 1729 and Montesquieu from 1729 to 1731. The latter, on returning, made his garden La Brédé in the Gironde, in imitation of an English gentleman's estate. Their enthusiasm for English literature set the style for it in France. In 1760 Thomson's "Seasons" was translated. At about the same time Rousseau's "Julie, ou la Nouvelle Héloise" was tempting people to lay out their own romantic wildernesses, after that imaginary garden on the Lake of Geneva—"nothing regular and nothing leveled," where life would be free from "those petty virtuosi, those small florists, who swoon at the sight of a ranunculus and prostrate themselves before a tulip."

Due to these various influences, the rococo garden of 18th century France was a hybrid—part Chinese, part English. In fact, it was referred to as *Le Jardin Anglo-Chinois.*

Some English Gardens in France

The first appearance of this style has become a matter of dispute. Some say it was when the Princess de Montmorency piled up a Chinese mountain in her garden at Boulogne. Others attribute it to Claude Henri Watelet's four-acre garden on the Seine near Paris called Moulin Joli. L'Abbé Jacques Delille, in notes to the first canto of his poem "Les Jardins," states that the first English garden appeared at Auteuil, on the estate of the Comtesse de Boufflers, that intimate of Rousseau. Whichever one was the first makes no difference. The style soon spread. Even town gardens in Paris began blossoming out in their notions of what Chinese or English gardens should be—vest-pocket parks with vine-covered romantic arbours and rockeries and cascades. At Roissy, near Senlis, the Comte de Caraman made such an impressive demonstration of the Anglo-Chinois that when Marie Antoinette saw it she declared she would not rest until Caraman designed a garden for her.

One of the most famous landscape gardens in France—the one most responsible for the introduction of the English garden—was that of the Marquis René de Girardin (1735–1808), at Ermenonville. Here between the years 1766 and 1776 he developed a neglected marsh into a highly ornamental farm filled with rustic and melancholy scenes—a garden in ruins, fabrics with inscriptions in English, French and Italian, tombs, a rustic hut and cottage, a cascade, a flour mill, a temple of philosophy. His wife and children were obliged to dress up to this garden—the girls in country maidens' costumes and the boys clothed as peasants. Girardin maintained a band of musicians who wandered about the grounds tooting melancholy rustic airs.

This garden was the result of Girardin having studied the English romantic movement closely. He had steeped himself in the writings of Whatley, Shenstone, Mason and Chambers, and had visited many English gardens. So thoroughly did he subscribe to the British theory of garden design being landscape painting—"the poet's feeling and the painter's eye"—that he had the landscape painter G. F. Meyer make up imaginary views of what he and Girardin thought might be done to the place at Ermenonville—and the estate was laid out on the lines of these paintings.

Writing of his gardens in "De La Composition des Paysages," Girardin denied that he had followed any particular style. He said that, with Meyer's paintings as a guide, he had merely made a series of interesting landscapes on his place, in fact, three naturalistic water scenes. In the execution of the plans he was assisted by F. B. Morel, who afterward set forth his notions of naturalism in "Théories des Jardins."

Ermenonville won its lasting halo of romance when Rousseau, forced to flee Paris, found refuge there. And there he stayed through those six weeks in 1778 before he died. On an artificial island in an artificial lake, beneath the wan shadows of poplars cast by moonlight, the prophet of Nature was laid away. There his ashes rested until they were entombed in the Pantheon in 1794.

The romantic circumstances surrounding this Ile des Peupliers caused it to be copied on many estates, and romantic gardens in the style of Ermenonville sprang up fast and thick. In 1784 Jean Benjamin Laborde, banker to the Court, spent an incredible sum on an English-type garden at Mereville, designed for him by Hubert Robert and Joseph Vernet. Laborde's son, Alexander, in 1808, published his "Descriptions des Nouveaux Jardins de la France." Another crown banker, Lepeletier, made Morefontaine famous for its English garden.

Two others of the aristocracy made elaborate gardens and wrote on them—the Prince de Ligne and the Duc d'Harcourt.

Charles Joseph de Ligne (1735–1814) worked on his estates at Beloeil in Belgium for twenty-seven years, and from these experiences extracted those ideas contained in his book, "Coup d'Oeil sur Beloeil," 1781, which, also published in two successive enlarged editions, made him the foremost European critic of the new garden style. Withal he was a philosopher. He would teach gardening to children as soon as they could hold a spade, for he believed that the act of gardening held in it the germ of safety for the state.

The Duc d'Harcourt was lieutenant governor of Normandy, where he made a garden and wrote down his theories of garden art in a manuscript, "A Treatise on the Decoration of Grounds, of Gardens and of Parks." Though the manuscript was not published until 1919, when it was discovered by Comte Ernest de Ganay in the Bibliothèque Municipale at Caen, Harcourt was evidently well known for his ability, since he was asked to lay out several gardens.

By far the most amazing of these landscape efforts was to be found on the Duc de Chartres' place at Monceau. The Duc was a confirmed Anglophobe and it was natural that he should make a garden in the English taste. The wonders Monceau revealed are almost beyond belief. It contained tombs, an Italian vineyard, a group of rustic cottages, a Dutch windmill, a Tartar tent and a *jeu de bagne* with Chinese attendants. There was also a hexagonal garden, with roses in the centre and colour blocks each side, that sounds very much like some of the advanced designs of modernist French garden architects today. In this garden were enough and plenty of those diversions which the English Sir William Chambers thought necessary to attain the garden ideal—"to agitate the mind by a variety of opposing passions." In 1779 Carmontelle, the dramatist and painter, who had first assisted the Duc in planning the garden, expatiated on the place in "Le Jardin de Monceau."

However, the one responsible for the final state of these wonders at Monceau was not a Frenchman, not even an Englishman —he was a Scot, Thomas Blaikie (1750–1838), whose diary only within a few years has finally seen the light of print. Blaikie was first sent to Switzerland in 1775 by Drs. Fothergill and Pitcairn to search for rare alpine plants. He is believed to have been Dr. Fothergill's gardener. At any rate he displayed a lively interest in botany, as is demonstrated by the fact that he sent back to his patrons no fewer than four hundred and forty packages of plants. This commission finished, he entered the services of the Comte de Lauraguais, and helped him lay out his model farms in Normandy. Then Blaikie went up to Paris.

For a time he worked under Antoine Richard, the English gardener at the Trianon. Later he was employed at Malmaison, which he stocked with trees and shrubs brought from London. He was responsible for the designing of many places. One of them was the Bagatelle for the Comte d'Artois. The building was planned by François Joseph Belanger, the last of the great 18th century architects, and Blaikie did the garden. The work was accomplished in an incredibly short time in 1778.

Blaikie lived a long and romantic life. To his forty-acre garden at St. Germain came all who loved flowers. He well earned his reputation as the foremost designer of English gardens on the Continent. He and Gabriel Thouin, who designed the Jardin des Plantes, were considered the two eminent *artistes jardiniers et architects des jardins* in France.

As a result of the various rustic scenes made on country places, the rustic village or *hameau* soon became the rage. The first was built at Chantilly in 1780, a group of thatched cottages and a water mill by a stream. The Duc d'Orleans built a *hameau* at Raincy near Paris and the king's sister, the Comtesse de Provence, had her rustic group at Montreuil near Versailles. However, the best known of these *hameaus* appeared at the Petit Trianon.

Early in his reign, Louis XVI had given the Petit Trianon to Marie Antoinette, and she soon displayed a keen interest in gardens. Having been captivated by the rustic diversions at Parc Monceau, she first directed her English gardener, Antoine Richards, to make a design for her. Evidently his project for pagodas and a Chinese theatre and Turkish fountains did not appeal to her taste. She asked the Count de Caraman, whose ornamental farm at Roissy she had admired, to make another plan, and this one she accepted. Caraman began the work in 1775 by moving Louis XVI's botanical collection to the Jardin des Plantes. Then Marie visited Girardin's estate at Ermenonville and was completely captivated by the rustic group of cottages. She simply must have a *hameau!* Richard Micque (1728–1794), the new fashionable architect, and Hubert Robert, were ordered to design one. From 1778 to 1782 the work went on. Beside a lake was spread the model farm with its dairy and Swiss sheep, and there the queen and her friends amused themselves making butter and cheese under the direction of the farmer's wife. And out in the gardens, Claude Richards, who had succeeded his father, pleased her by growing lots of flowers. Just a bit of rural calm before the tumbrel began rumbling down the streets of Paris and the mobs surged around the guillotine.

For years the *Hameau* has been one of the most delightful spots in Versailles. While Time gave it a lovely patina, it did not deal any too kindly with its fabric. The recent Rockefeller restoration has shocked critics because the buildings now appear so glaringly new. Well, they were new and glaring when Micque and Robert turned them over to Marie. Arthur Young declared that they displayed "more effort than Nature—and more expense than taste." The same was probably true of the *hameau* and dairy in the rustic Italian style which the Empress Josephine began at Malmaison in 1799, and of which so little remains.

Many of these romantic garden structures were temporary affairs, flimsily built. They have disappeared. One wonders whatever became of that apotheosis of sentimentalism erected by De Monville at Retz near Marly—the house that was the base of a broken column!

After the Revolution the English romantic garden came to be the ideal of the middle classes, and when Napoleon III developed the Bois de Boulogne, he supplied it with race-tracks and restaurants and lakes for boating in which the populace might disport themselves.

French Books About English Gardens

The interest in rustic and rococo gardens was well supported by literature. The first gun was sounded in 1753 by Laugier's "Essai sur l'Architecture," of which two French editions followed and two English translations, one of them as late as 1786. Whatley's "Observations" were translated in 1771 by Masson de Blamont (who also translated Mason's poem, "The Garden") and immediately became a textbook for the French. Horace Walpole declared that this really introduced English gardening taste into France. Walpole's essay on English garden development was translated in 1785 and read and discussed everywhere by people of taste.

Meantime, in 1776, George Louis Le Rouge began publishing "Collections des Jardins Anglais-Chinois," which ran through twenty-one parts and displayed large plate views of gardens in the various interpretations of the English style, including even one in the Anglo-Greek manner! L'Abbe Delille's "Les Jardins" 1702, made an impression not alone for its verses but also for its notes: they were most complimentary to the English taste.

Claude Henri Watelet (1718–1786), who wrote the next volume under consideration, was a state official who found time to paint and etch and to make that ornamental farm, Moulin Joli, which was the talk of his time. In 1774 he wrote "Essai sur les Jardins," in which he stated that the three desirable characteristics in an estate were the Picturesque, the Poetic and the Romantic. He also classified the *ferme ornée* as a useful establishment. The ornamental farm should be a model farm. This was rather an important point. It marked a change for the better in agriculture. The interest in rustic scenes as objects for copying in gardens was paralleled, after 1750, by a desire for agricultural improvements. Books on the subject began to appear. Agriculture became fashionable. Agricultural societies were formed. Between 1760 and 1790 more farm advancement was made than in the three centuries before.

Many books tended to lead the thoughts of the people away from the artificial life of towns and cities back to the simplicity of the country—books such as Saint Lambert's "Le Saison," 1764; and Bernardin de Saint Pierre's "Etudes de la Nature," 1784; and "Paul et Virginie," 1787. Even the Dunkirk nurseryman, Robert Xavier Mallet, tried his hand at extolling the rural scene in "Beauté de la Nature," in 1775.

The interest in dilapidated antiquities found a voice in 1770 in "Les Ruines de Plus Beaux Monuments de la Grèce," and, twelve years later, in Gouffier's "Le Voyage en Grèce." In a sense, too, these were a foreshadowing of the classicism that eventually was to arise and overcome the landscape school. There were some who raised their voices and their pens against the *Jardin Anglais,* for in France, as it had been in England, the rise of the landscape garden was paid for in the destruction of much ancient garden beauty. But the Chinese taste still persisted. In 1784 Le Rouge published a volume of Chinese drawings showing the eleven principal pleasure palaces of the Chinese emperor. It was well received even though the text was in Chinese.

English Gardens Spread Over the Continent

It is customary, among the very fastidious nowadays, to shudder at the mention of the English landscape garden and to lament its spread over the Continent. They point not alone to magnificent formal gardens of England and France that were sacrificed to it, but also gardens in Germany and Italy. They even rather regret the fact that these gardens touched that most western of oriental nations, Russia. Nevertheless, thus widespread was the extent of its influence.

The reason for it? Well, the romantic garden was fashionable and the contemporary chic has little regard for the past. Also, many of the nations into which it penetrated had grown wearied of the past. Tradition hung about their necks like a millstone. They were glad enough to rid themselves of it.

Take Germany, for instance.

The first English gardens there appeared about the 1750's when a mixture of the Chinese and mediæval tastes began to creep into formal gardens. Between 1736 and 1740, when he was Crown Prince, Frederick the Great put Chinese fabrics into Rheinberg. The garden of the Eremitage near Bayreuth, laid out for Frederick's sister, boasted a theatre in the woods and was a conglomeration of the grand manner of Versailles and the picturesque ruralism of an English estate. At Sans Souci Frederick set up sham ruins, a mausoleum, Roman baths and a Japanese house, and his taste was copied slavishly by others of the smaller principalities in Germany. At Munich the American—Count Rumford—delighted to use the romantic style in the Englishcher Garten he was developing for that city by 1789. In this work Rumford was ably assisted by the garden architect, Louis Sekell.

Among the garden architects working at this time in Germany, four rose to fame—Pigage, Petri, Zepher and Sekell. In the 70's Sekell had studied at Versailles, the Tuileries and in England, and he came back to Germany thoroughly saturated in the Romantic tradition. Assisted by Pigage, he worked on the gardens of Schwetzinger near Heidelberg. He was connected also with the Nymphenberg gardens and those at Baden-Baden.

In these German interpretations of the picturesque garden, the influence of classicism was often far more pronounced than that found in English or French gardens. Prince Leopold of Anhault-Dessau, for example, after studying gardens in England, returned at the tender age of twenty-three to start transforming his place at Worlitz. At the moment the cultured world was thrilled over the archæological discoveries of Winckelmann in Italy, so the young prince must needs have some of the archæology in his garden. Consequently we find that he had a Roman pergola, a Greek theatre, a Blue Grotto like the one at Capri and a realistic fire-belching volcano symbolizing Vesuvius that overcame Pompeii and Herculaneum. The place also abounded with water—a lake and creeks and inlets. It likewise had its Ile de Peupliers.

While these may sound fantastic, by no means did they represent the apotheosis of sentimentalism. Indeed, it is difficult to choose the pinnacle of these romantic fantasies. The Garden of Rosswald near Troppau in Silesia had a Chinese garden, a holy grave, hermitages, Indian pagodas, a miniature town for dwarfs in which children were induced to live, druid caves, a royal palace and a church. At Hohenheim near Stuttgart were built the ruins of a Roman town. Some gardens contained mediæval castles in which the peasants, dressed in armour, were obliged to go through tilting. In Potsdam a half-buried temple concealed a kitchen; an ice-house was camouflaged under a pyramid; a hermitage concealed a bath. In another a hay cart hid a dining room, and a pile of wood, a pavilion.

The movement in Germany had its poets and essayists—Mayer and Hirschfeld and Goethe particularly. Johann Procopius Mayer, a Bohemian botanist, in 1776 published his "Pomona Franconica," which, though a botanical work, sought to defend Germany from the inroads of English naturalism. A Professor of Philosophy at Keil and a popular painter by avocation, Christian Hirschfeld directed popular attention toward garden design and the technique of gardening in "Observations on Garden Art," 1773, "Theory of Horticulture," 1775, and a five-volume work, "The History and Theory of Horticulture," 1779. Due to his influence, and to the influence of Sprengel, Goethe displayed an intense interest in botany, and his place at Weimar was laid out as an English park. Christian Konrad Sprengel (1750–1816) was pastor at Spandau, but so keen became his interest in botany that he neglected his congregation and was dismissed. In his "Newly Discovered Secret of Nature," 1793, he pointed out that the colour markings, shapes and nectars of plants help cross-fertilization by attracting insects. Darwin was eventually to bring this theory to the fore and to give Sprengel the credit due him.

It may also make life a little more bearable for some of us to remember that one of our best beloved common annuals was named in honor of a Professor of Medicine at Göttingen in this century—Johann Gottfried Zinn.

The final decline of romanticism in Germany—or maybe, it was its most moderate exposition—was found on the estate of Prince Hermann von Puckler (1785–1871), at Muskau in Silesia. He began working on it in 1815 and continued his labours for thirty years, even embarrassing his finances to gratify his taste for horticultural experiments and landscaping. He had a passionate love of trees, an enthusiasm that caused him to import them even from America. With them and with water he made soft landscapes patterned after landscape paintings from the plans he made for the place. He also planted, beside his house, one of the most astounding examples of bedding-out. His "Hints on Landscape Gardening" were translated into English in 1917.

To Italy, Switzerland, Sweden, Poland and Russia the English garden penetrated. Les Délices, Voltaire's garden at Geneva, was one of the most celebrated of those laid out in the English taste. Gustave III of Sweden laid out his garden at Haja in this style. At Pultawa in Poland the Princess Czartoryska could boast of an English gardener whom she had imported and who, with the help of local artistic talent, worked on the place from 1780 to

1784. The Russian royal gardens were in a number of styles. Peter the Great had laid out the gardens of the summer palace on the Neva in the Dutch style, which he learned from his stay in England. For the Peterhof, however, he imported Le Nôtre's pupil, Alexander Le Blond. When Catherine II came to the problem of the gardens around Tsarskoie Selo in 1768, she divided her favours; part was laid out in the style of Versailles and part—the work being executed by her English gardener, John Bush—in the English style.

Just as Le Nôtre's pupils in a previous century had overrun Europe, so did the pupils and designs of "Capability" Brown crop up in strange localities. Brown is reputed to have drawn the plans for the park of Oranienbaum near St. Petersburg and a Brown protégé, Gould, was gardener to that fantastic horticulturist, Prince Potemkin, who not only had several permanent gardens but also travelled with a company of gardeners in his suite, who set up groves of potted plants and trees and laid out gravel walks wherever he stopped on his journeys!

Botanical Advancement

The pursuit of botany was part and parcel of the 18th century enthusiasm for scientific investigation. Among educated amateurs it was studied and followed as a fashionable hobby; indeed, many of the advances made in 18th century botany were due to the efforts of inquiring amateurs. The Collinsons and Pitcairns and Fothergills of England, the Logans, Bartrams, Marshalls, Darlingtons and Coldens of America, the Goethes and Sprengels and Hirschfelds of Germany—such were the amateur scientists who pursued this hobby with eager delight. With some of them, it grew from a pleasant avocation or hobby to an engrossing profession and the main passion for the remainder of their lives.

The efforts of these botanists were manifold. They sought new plants and strove to classify them, they studied their structure, their relation to the soil and air, their sex and methods of reproduction, etc. For the majority of botanists the most important of all was the classification of the new plants that were being discovered and of those already known. Botany was still groping in the mazes of classification.

Thus far in this book we have encountered quite a number of attempts to classify plants. There was Cæsalpinus' crude grouping based on a primitive conception of plant sexes. There were the schemes of Morrison and Ray, in 17th century England, which grouped plants according to their flowers and fruits. Germany, of 1690, saw something akin to that when Augustus Quirinus published his "Introductis Generalis in Rem Herbarium" and classified plants by the form of their flowers. In France Tournefort, as we have seen, made his groupings of genera.

Then, in the 18th century appeared two leaders who were to bring botany out of its confusion—Linnæus with his binominal system and Jussieu with his "natural" classifications.

Linnæus

It is futile to expect to squeeze into the narrow confines of a few paragraphs all the enchanting facts of Linnæus' life. There are ample and full-volumed lives of him—Benjamin Dayton Jackson's "Linnæus," being one of the best.

The son of a country parson, who was himself an enthusiastic gardener, Carl von Linné was born in 1707 at Rashault, Smaland, Sweden. He came from peasant stock. His family selected the church as his vocation, but he elected medicine, and at an early age began collecting plants. While at Upsala University he filled his spare time making herbarium specimens. The college botanic garden was in a neglected state and young Linné tried to work there. One day, while studying these plants, he was discovered by Dr. Olop Celsius, who promptly took the poor boy into his house and became his benefactor. From Celsius' house he passed to the household of the botanist, Rudbeck, as tutor to the numerous progeny of that great scientist.

All these early student years Linnæus used the system of plant classification proposed by Tournefort. By 1730 he began trying out one of his own and by the time he was twenty-four, he had completed the sexual system that he explained in "Systema Naturæ." It was a clear and easy scheme whereby all products of Nature might be arranged and found again. In his student lectures and demonstrations he experimented with the new system.

In 1732 he began his travels. At that time Lapland was a fairly unknown area and he set out to botanize in it. Just how was one equipped in those days to make a botanical expedition? He wore a linsey-woolsey coat, leather breeches, a round wig, a green leather cap and a pair of half-boots. He carried a small leather bag containing an extra shirt, two pairs of false sleeves, two half-shirts, an inkstand, pen case, microscope, spy-glass, a gauze cap to protect him from gnats and mosquitoes, a comb, a journal, paper for drying plants and two manuscripts he had been working on at college. He also carried a small fowling piece and a stick with graduated marks for measuring. Thus equipped, this young botanist of twenty-five started out on that long journey which kept him occupied from May to October.

On returning, he continued his college work, and finally, in 1735, undertook his second venture; he went to Holland to prepare for his degree in medicine. Among the things he took along was his Lapland costume. It served Linnæus the same purposes of pleasant publicity in Holland that Benjamin Franklin's coonskin hat served in Paris. Here in Holland he began to make most valuable connections. He met Jan Frederick Gronovius and showed him the manuscript of "Systema Naturæ," and that great man insisted that it be published. He met the venerable botanist and chemist, Herman Boerhaave (1668–1738) and used to botanize in the old gentleman's garden and other parts of Holland. He was induced to go to England, where Peter Collinson of London and Dr. Dillenius of Oxford received him rapturously, but Sir Hans Sloane and Philip Miller were rather contemptuous of the young Swede's crazy notions about plant classification. However, this snub did not slow down Linnæus' genius for work.

Before he left Holland, in 1738, he published twelve or fourteen works. This done, he repaired to Paris where he met the botanists Bernard and Antoine de Jussieu, d'Isnard, and Tourneforte's travelling companion, Aubriet—the same one we remember in that lovely little spring flower, Aubrietia. With all these men he was trying out his new system. By the time he returned to Sweden, he had made himself fairly well acquainted, either in person or by correspondence, with the key-men in botany on the Continent and in England.

The newly made doctor was almost instantly successful in building up a practice in Stockholm. He came to the notice of the Court and was appointed physician to the Admiralty. Meantime he helped to establish the Scientific Academy, delivered lectures on botany and mineralogy, and married.

From Stockholm he went back to the University of Upsala, where he had been appointed Professor of Medicine. This was in 1741. From that time on his lecture hall was thronged with students, his botanical excursions a popular extracurriculum activity and under his watchful eye the university botanical garden, of which he had been made prefect, was put in order and greatly enlarged. To it were sent plants and seeds from all over the world.

To his lectures, also, came students from all over the world. Forty-five foreigners in all studied with him, hailing from America, England, France, Germany, Russia and Italy. His books, increasingly popular, were brought out in many editions. Surrounded by those who loved and respected him, this grand old man of botany lived his busy, sweet life until June 10, 1778. Today his botanic garden and home are a Mecca for all those who pursue the garden way, and in the Linnæan Society of London are carefully preserved many of his collections.

It was said of him: "God created, Linné set in order." Had he done nothing more than establish his system of classification, he would have won immortality. But, like any good teacher, he spread his circle of influence even wider in the labours of his students. His best pupils he launched on their careers by finding them congenial work or chances for botanical exploration in distant lands—his "apostles," he called them. The English student John Rotheram eventually rose to the chair of physics at the University of St. Andrew and the American Adam Kuhn to the chair of medicine in Philadelphia. Peter Kalm explored the American colonies for plants. Frederick Hasselquist travelled in Palestine, Arabia, Syria and Smyrna. Petrus Lofling went to Spain, Portugal and Spanish South America. Pehr Forskal to Egypt and Arabia. Daniel Solander to England and the South Seas on journeys with Joseph Banks. Thunberg brought back from Ceylon, Java and Japan those plants and news of gardens that meant so much to the Dutch.

The extent to which Linnæus' books were read in far-off lands we have already noted—Bartram whacking up Latin in Philadelphia so that he might comprehend them, and the urbane, scientific Cadwallader Colden up the Hudson, teaching them to his daughter. By 1788 Fr. Joannis de Louriero, the Portuguese Jesuit, had written the first post-Linnæan flora of China—"Flora Cochinchinensis."

Jussieu and His System

In only one country did the Linnæan system fail to become established—in France. And the story of the Gallic system involves telling the story of an amazing botanical family—the de Jussieus: Bernard de Jussieu (1699–1776), Joseph de Jussieu (1704–1779), Antoine Laurent de Jussieu (1748–1896) and Andrien de Jussieu (1797–1853).

Bernard was first a physician, then a botanist. By 1758 he had followed the latter calling so successfully that he became superintendent of the garden of the Trianon. Here he worked with his nephew, Antoine Laurent, and evolved a system of grouping plants by their natural affinities. This Trianon or Natural System is followed by some botanists to this day. While Bernard did not write extensively, his theories were amply set down by Antoine Laurent in "Exposition d'un Nouvel Ordre de Plantes Adopté dans les Demonstrations du Jardin Royal," 1774; "Genera Plantarum Secundum Ordines Naturales," 1789; "Introductio in Historiam Plantarum," 1837. Antoine was professor at the Royal Garden from 1770 to 1826.

Antoine Laurent's son Adrien likewise wrote monographs and a "Cours Elémentaire de la Botanique." The last of the four, Joseph, was the plant collector of the family. In 1735 he accompanied Louis Godin and Charles Marie de la Condamini to Peru where they were to make scientific measurements. The expedition lasted nine years. In 1774 it descended the Amazon. Among the results of the expedition was that it brought to Europe its first knowledge of rubber. Godin stayed a little longer—until 1751—because he had accepted a professorship of mathematics in the University of Lima. Meantime, Joseph de Jussieu put in fifteen years studying the botany of the Andes. He was also specializing in chincona. Through the dishonesty of a servant, his vast botanical collections were lost; and Joseph, at the age of sixty-five, poor fellow, went mad.

The Natural System of Bernard de Jussieu was early supported by Augustin Pyràmus de Candolle (1778–1841) who founded another dynasty of French botanists that extended down through the 19th century. In 1813 Augustin published his "Théorie Élémentaire de la Botanique," and later "Systematis Naturalis." His son Alphonso de Candolle followed him, writing many books that are standard today.

There was plenty of new material for these botanists to work on. They read P. F. X. de Charlevoix's "Histoire et Description Générale de la Nouvelle France," in 1744, and Le Page du Pratz's "Histoire de la Louisiane," fourteen years later. By 1768 J. B. Bossu was making his voyage to New Orleans and the Mississippi Valley, and in 1783 William Young, Jr., presented his "Catalogue d'Arbres, Arbustes et Plantes Herbaces d'Amérique." Michaux's American plants were pouring into Rambouillet and from French expeditions to other lands were many additions for the botanists to classify. Before the end of the 18th century and into the 19th the great Redoute was making his incomparable portraits of flowers.

Out of the plethora of other European botanists on the Continent it is difficult to select those that most closely affected gardeners.

Perhaps we should lay a verbal wreath on the grave of Albrecht von Haller (1708–1777), the Swiss all-round scientist, who, among other achievements, specialized on studying Alpine flora and, together with Rousseau, stimulated a new passion for mountain scenery. It was to Haller that Thomas Blaikie, the Scotch gardener, carried letters of introduction from Drs. Fothergill and Pitcairn when they shipped him off to Switzerland to collect plants for them.

We might also lay a wreath to L'Able Nolin who burned with such an enthusiasm for exotic plants that he did not rest content until he saw established in Paris a special nursery for cultivating them.

No exploration in this century would dream of starting without its botanist. The English admiral, Vancouver, had as botanist and surgeon Archibald Menzies; Captain Flinders, who named Australia for the British, took along Robert Brown, botanist, Ferdinand Bauer, botanical draftsman and Peter Good, a gardener from Kew. Their boat, the *Investigator,* had a cabin especially equipped for the care of plants. Nor were the French behind the British in botanical equipment. The 1791 expedition to Australia, under Admiral D'Entrecasteaux, carried aboard J. J. Labillardière for naturalist and the 1802–8 expedition under Nicholas Baudin, which introduced many Australian plants to France, included a naturalist and three gardeners. Many a French navigator, too, is remembered in the names of plants—in the lovely vine Bougainvillea, we remember De Bougainville and in Lapeyrousia, the naval officer Jean François G. de Lapeyrouse.

Russia Enters the Botanical Field

Apart from the recent mention of the picturesque English garden in Russia, that country has not been noticed since the elder John Tradescant, 'way back in 1618, visited Archangel and found the yellow cranberry and "Rosses, wondros sweet . . . and pincks growing natturall." Under Peter the Great, his country begins to wake up. Peter's ambition was for Russia to open a window on Europe. Botanically speaking, Europe began opening a window on Russia.

In 1714 Peter ordered one of the islands in the Neva to be laid out as a garden for medicinal plants. It was called the Apothecaries' Garden. This spot having been found unsuitable, a botanical garden was founded in St. Petersburg in conjunction with the Academy. Meantime Siberia was looming to the East. The Cossacks had conquered practically all of it by the first half of the 17th century. Cities and forts were built, and the year the Continental Congress signed the Declaration of Independence the Russians were established in Alaska. This vast extent of territory had never been touched by botanists. On a visit to Danzig once, Peter asked the botanist Breynius to recommend someone who could explore Siberia. He suggested Daniel Gottlieb Messerschmidt (1685–1730). From 1720 to 1727 he travelled in Siberia and made a large collection of plants.

Other German botanists soon began tapping that country, among them Johannes George Gmelin (1709–1755), professor of botany in Tübingen, who brought out a "Flora Siberica" in four volumes from 1747 to 1769. In 1767 Catherine II summoned Peter Simon Pallas (1741–1811) to St. Petersburg to serve as Professor of Natural Science. In 1771–76, he published a three-volume botanical work. The 18th century saw fourteen botanical works on Russia appear.

Thus Peter's window was opened. In the 19th century it was to open still wider—and our gardens are richer today for it.

A Last Word on Missionaries

As we began this chapter with missionaries, so might we close it. Next to Siberia lies China and in China and the Far East the plant-hunting missionaries began to make their work felt. In 1656 Michel Boym, a Polish Jesuit, had produced a "Flora Sinensis," in which Chinese herbal medicines were described, and some twenty-two plants from the Indian archipelago—among them, strange to say, three tropical American plants; the pineapple, the guava and the custard apple. How did they get there, one wonders. George Joseph Kamel, a Moravian Jesuit, worked in the Philippines and made ninety drawings of plants, including sixteen kinds of oranges. Linnæus is said to have named the Camellia for him. From the Jesuit missionary letters, as we have seen, John Baptiste Du Halde compiled his description of the Chinese Empire in 1735.

Then in the first half of the 18th century more names appear. Russian caravans, slowly crawling across Siberia, bring to Moscow and St. Petersburg plant collections made by L'Abbé Bignon, Abbot Josephus Ignatius Cordero, and Fr. Antoine Gaubil. The last named was a member of the Academy of St. Petersburg and sent his seeds there. Then came Fr. Pierce d'Incarville (1706–1757) a pupil of Bernard de Jussieu, who sent back to France seeds of the China aster, Ailanthus, Sophora, *Syringa villosa,* a Caragena and a Vitex. He kept up a botanical correspondence not alone with Paris, but with St. Petersburg as well. We remember him in the Incarvillea.

Another who corresponded with the Academy there was Fr. Peter Martial Cibot, S.J. (1727–1784). The Portuguese priest, Joannis de Loureiro (1715–1796), as we have seen, wrote his "Flora Cochinchinensis" after Linnæus' system. His seeds and plants he sent to Portugal, England and Sweden. Jussieu had an enthusiastic correspondent in Pierre Poivre (1719–1773) of the Mission Etrangères. He was first sent to China in 1740 and on his return to France started a nursery, Monplaisir, where he grew tropical plants.

Thus began the long line of those that trailed through the 19th century and continues on down to our own day—Frs. Llanos of the Philippines and Armand David, Jean Marie Delavay, Urbain Faurie, Paul Farges, P. C. Silvestri, Jean Andrew Souliei, Guiseppi Giraldi and Hugh Scanlon, whose names we remember in many a plant growing in our gardens—*Buddleia Davidii, Delphinium Soulıei, Maachia Fauriei, Paulownia Fargesii* and *Rosa Hugonis.*

Whereas these missionaries first searched for economic plants, they soon began collecting trees and shrubs and flowers just for their beauty or unusual characteristics alone. We do not know to what extent they converted the heathen Chinee, nor, for that matter, does it make very much difference. They more than justified their labours in those distant lands by the living beauty they sent back to our own.

CHAPTER XVI

MINGLED GARDEN ADVANCES IN THE NINETEENTH CENTURY

WE left the last chapter with an appreciation of those missionaries who found time in their busy lives to search for plants whereby our gardens are now enriched. They are only one small section of a great group, however. This 19th century was the most active age of plant-hunting, and the plants, in turn, often changed the form of gardens. To tropical Africa, to distant Australia, to the mountain ranges of South America and the steaming jungles of Central America, to Tasmania, New Zealand, China, Korea, Siberia, Mongolia and the western reaches of the United States, these fervid, intrepid botanists made their way. Some were dispatched from botanic gardens, some by the governments of their respective countries, some by scientific nurserymen, some by enthusiastic individuals.

To Africa go Bruchell, Baines and Bowie; to Australia, Allan Cunningham, James Drummond and Backhouse. Cunningham and Bowie also search in Brazil, and Thomas Drummond, brother of James, crosses Texas and is remembered for the little phlox that commemorates his name. Over Tasmania the French and British have a race, the latter winning. New Zealand sees Charles Fraser and Allan and Richard Cunningham. Archibald Menzies, who had been with Vancouver, goes to Chile and Australia. China knows a brilliant succession of them—Kerr, Reeves, Potts, Parks, Fortune, Henry, Bretschneider, Wilson. India is penetrated by Joseph Hooker, and, in our own day, by George Forrest and Reginald Farrer and Kingdon Ward. Schleppenbach opens up Korea. Siebold and Hall do the same for Japan. From Siberia and Outer Mongolia Maximowicz, Langsdorff, Bunge, Kirilov, Maack, Prezwalski, Potavin and Regel bring back innumerable treasures. And into the reaches of the American continent west of the Mississippi go Lewis and Clark, Z. M. Pike, Stephen H. Long, Lewis Cass, Constantine Rafinesque, Samuel Wilkes, Henry R. Schoolcraft and Frémont and Abert.

Seven Plant Explorers

Pick out any seven men from this aggregation and let's see what they did for our gardens—Allan Cunningham, Robert Fortune, F. B. von Siebold, Carl Maximowicz, the Baron Alexander Schleppenbach and Dr. George R. Hall.

Allan Cunningham (1791–1839) was a Kew man. In 1814 Sir Joseph Banks sent him to Brazil. Two years later he was dispatched to New South Wales, and from then on to 1831 he was constantly exploring and collecting. He visited New Zealand in 1826 and finally reached Sidney. Tuberculosis carried him off at the relatively early age of forty-eight. If you would seek his monument, read any list of plants from the countries he visited.

Before the full orchestration of Robert Fortune is presented, we must introduce him by three of his predecessors and by the man who made much of his success possible. The three were William Kerr, John Reeves and John Potts, and fourth was Dr. Ward.

William Kerr was first sent to China and in 1812 settled down as superintendent of the Royal Botanic Garden at Colombo in Ceylon. We remember him when *Kerria japonica* puts out its little golden powder puffs. Reeves was a tea inspector for the East India Company who pursued his appointed task in China and collected plants for Sir Joseph Banks as an avocation from 1812 to 1831. Chinese azaleas, chrysanthemums, mountain peonies, primroses, wistaria—all of these he grew in pots, and he induced the company to build greenhouses on the decks of their ships in which he sent back home his potted discoveries.

John Potts is distinctive in that he represented an entirely new organization. In 1804 there had been formed in London the Horticultural Society. Its leading geniuses were Thomas Andrew Knight and Sir Joseph Banks. Its purpose was both to receive new plants from foreign lands and to send men out to find them. It sent Francis Masson to the Cape and Nelson with Captain Cook. It sent George Dorr to West Africa and Spanish America, John Forbes to East Africa, John Roe to the Sandwich Islands, and David Douglas to North America and California. In 1821 it dispatched John Potts to China and the West Indies, and, two years later, saw John Dampier Parks off for China. Thanks to their endeavours, gardens were richer by new peonies, chrysanthemums and the double-flowered yellow Banksia rose.

Sending back live plants in those days must have been very discouraging. Herbarium specimens were easy, for they were dried and packed flat. Though some seeds soon lost their viability, many did travel with a reasonable success. Living plants presented an entirely different problem. Only a small percentage of them landed in England or the Continent alive. The sailing ships that carried them were slow and at the mercy of the elements. They had to pass through extremes of climate. Often the ships' captains were none too careful of these strange cargoes. John Reeves' deck greenhouses were a step forward, but not enough of an advance. Real progress could not be marked until after 1832. In that year an amazing discovery was stumbled on.

At the Chelsea Physic Garden was an examiner to the Society of Apothecaries, Dr. Nathaniel Bagshaw Ward (1791-1868), a busy London physician, whose hobby was collecting and preserving butterflies. One day he placed a chrysalis in some soil in a glass bottle and covered it with a lid. Shortly afterward, minute vegetation appeared on the soil, which eventually grew into a fern and a grass. He extended the experiment by making a closed glass structure, since it was evident that certain kinds of vegetation can adapt themselves to an unchanging atmosphere. The exhaled moisture from the plants and soil maintain the plants in a normal state. In 1832 he shipped two cases of ferns and grasses from London to Sidney. They landed safe. The cases were refilled and brought back to England. They had been on the way eight months and in all that time not a drop of water had been added to them.

Meanwhile there had been in charge of the hothouses of the Royal Horticultural Society at Chiswick a young Scot by the name of Robert Fortune (1812–1880). In 1843 the society sent him to China. It was the first of two journeys he was to make for them. Later he went once for the East India Company and once on his own initiative, his itinerary also covering Formosa, Java, and the Philippines. Some of the areas he traversed were exceedingly dangerous and he was obliged to travel disguised as a Chinese peasant. He wrote four fascinating books about these journeys. His contributions to our gardens included camellias, peaches, roses, chrysanthemums, peonies, clematis, *Anemone japonica, Aconitum autumnale, Akebia quinata, Dicentra spectabilis, Viburnum tomentosum, Forsythia suspensia, Taxus cuspidata, Primula japonica,* and *Deutzia crenata plena*—all commonly grown today.

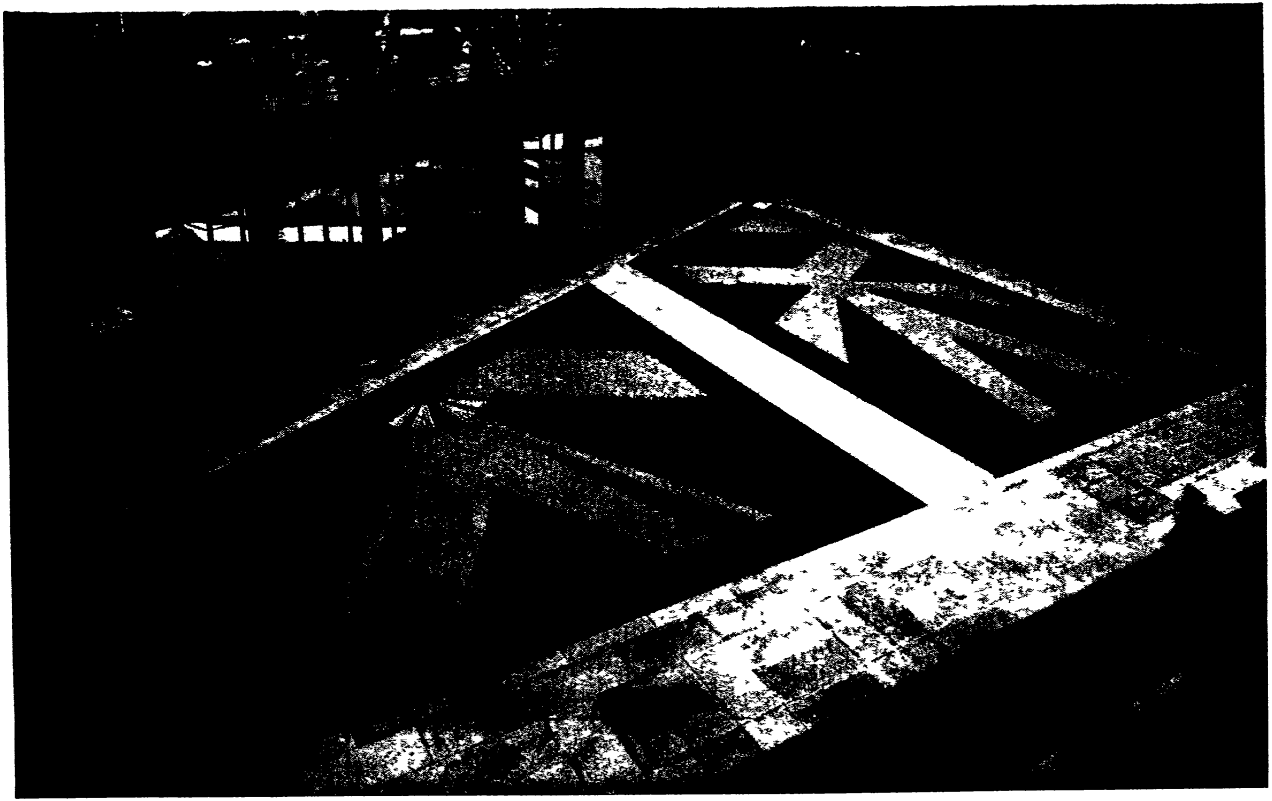
When we enjoy the autumn glory of the chrysanthemum we should think gratefully of Robert Fortune. He first introduced the Chusan daisy, the small-flowered type from which our present-day race of pompons is descended. Next, discovering that the chrysanthemum had been highly hybridized in Japan, he sent home a varied selection of them, from which new and unusual types were raised.

But his greatest feat of all was accomplished by means of Wardian cases. England had long since desired to start tea growing up in the hilly reaches of India. Several attempts to ship plants had failed lamentably. Fortune tried the new cases—shipped twenty thousand tea seedlings from Shanghai to the Himalayas. They arrived safely, and the Indian tea industry was begun.

Other wonders the Wardian case accomplished in the migration of plants: by it Chinese bananas were introduced into Samoa and Fiji, and Para rubber shipped via Kew from Brazil to Ceylon and Malaya, and in these cases cinchona seedlings were finally shipped alive from Brazil to India. Today India can ease the sufferings of its fever-wracked populace with quinine from its own trees. The Wardian case is commonly used by explorers today, and it is the plaything of curious gardeners in winter time—in fact the terrarium, that most recent of garden enthusiasms, is made possible by the discovery Nathaniel B. Ward happened on when he set that chrysalis of a pet butterfly in a closed bottle.

Japan Opens Up

Although in the 18th century Thunberg had been permitted to live and collect in Japan, and by the plants he gathered and his descriptions of gardens there, had produced many changes in the forms of gardens in Holland, Japan and the Japanese still remained a closed book for much of the world. The Dutch man-



THE PARIS GARDEN OF VICOMTE DE NOAILLES, LAID OUT IN DIFFERENT COLOURED GRAVELS AND STONES AND FLOWERS BETWEEN STRIPS OF STEEL. ANDRÉ VERA, LANDSCAPE ARCHITECT

A NEW YORK ROOF GARDEN—THE MODERN VERSION OF THE HANGING GARDENS OF BABYLON. INTO THIS SOPHISTICATED ATMOSPHERE NATIVE PLANT MATERIAL, SUCH AS KALMIAS, HAS BEEN INTRODUCED. ANNETTE HOYT FLANDERS, LANDSCAPE ARCHITECT aged to retain their confidence and trading relations. Consequently, when in 1823 the Bavarian surgeon, Philipp Franz von Siebold (1796–1866) in the employ of the Dutch East India Company, was sent to Japan, he was accepted by Japanese in high positions. He won their confidence through giving his medical skill without charge. In return for this he was granted the unusual favour of being permitted to wander where he chose, and he was allowed to take a villa near Nagasaki. Here he married a Japanese wife and here he accumulated his first botanical collections. Grateful Japanese patients began giving him rare plants. Unfortunately, some gave him maps of Japan. As the possession of maps was a treasonable offence in those days, the government ordered Siebold deported. He returned to Holland in 1830 and his house at Leyden he arranged as a museum. The Dutch government bought it from him in 1837.

During his stay in Japan he had constantly sent home seeds and plants—many of them new—and here at Leyden he established a nursery for their propagation and a *jardin d'acclimation.* In 1854 when Japan was opened up for foreigners, he returned there and again sent back plants. After that he was a constant shipper and importer. Most of the plants were snapped up by nurserymen—Lemoine of Nancy, Van Houtte of Ghent and Henderson of London. And a good thing Siebold made of it, too. Henderson paid $320 for *Fatsia japonica* and *Haya pecta* and its variegated forms brought $800 from Dutch gardeners. In all he imported three thousand specimens in seven hundred and seventy-three varieties and four hundred varieties of seed, and his collection of dried and mounted botanical specimens totalled over twenty thousand. Another of his accomplishments was the successful shipping to Java of tea plants which were the beginning of the prosperous tea plantations there. In collaboration with J. G. Zuccarini of Munich, Siebold wrote two important botanical works on Japanese plants—one of them, "Flora Japonica."

Like Siebold, George R. Hall (1820–1899) was a physician, and his opportunity came when Perry's expedition opened up Japan to foreign commerce. He did not attempt, however, to turn his plant exploring into a profitable business. Most of his finds he sent either to Francis Parkman of Boston or to Parsons & Company of Flushing, Long Island. Parkman, in addition to being a historian and a professor, was an ardent gardener, a noted rosarian and one of the most enthusiastic members of the Massachusetts Horticultural Society. To him Hall sent *Lilium auratum*, Parkman's crab, two kinds of *Lilium speciosum* and a double wistaria. In 1864 he shipped Parsons two new magnolias, Hall's honeysuckle, *Hydrangea paniculata grandiflora*, four wistarias and many Japanese maples and weigelas. The interest in the bulbs he brought back helped start the Japanese bulb export industry to America.

Russian Plant Explorers

With Schleppenbach and Maximowicz we introduce a phase of plant collecting of which all too little has been told. From the average accounts of this 19th century activity, one would gather that most of it was pursued by Englishmen in British-controlled territories and for the benefit of English botanical gardens. And yet constantly we find in our gardens examples of Siberian and Manchurian plants. They didn't just happen there. Many of them represent the Russian side of this activity.

As we saw in the previous chapter, Russia had a thriving botanic garden and was sending out explorers in the 18th century. With the turn of the 19th they increased. In 1803 Alexander I ordered a circumnavigation of the globe, and the commander, Admiral Krusenstern, took along as botanist George H. von Langsdorff, who made the trip from Kamchatka to San Francisco and collected en route. A second circumnavigation, under private auspices, included A. von Chamisso and J. F. Eschscholtz as botanists, both of whom are remembered in flower names. Still a third had abroad C. H. Mertens who is commemorated in Mertensia. At the same time a number of both official and private botanic gardens were springing up.

Active botanical exploration of the flora of Siberia and Mongolia began when Dr. Alexander von Bunge (1803–1890) was sent as district physician to Barnaul, Siberia. In 1826 he and C. F. von Ledebour explored the Altai Mountains and botanized in *Mongolia. Later he travelled in Persia and in 1836 became Professor of Medicine at the University of Dorpat. The year previous he had published an extensive study* of the new genera of Chinese and Mongolian plants. Bunge was followed by N. S. Turczaninov, *who explored the plants of the Lake Baikal and Transbaikal* regions.

In the middle of the century the rich Armur Valley, which drains an incredibly black soil belt stretching from Transbaikalia to the Pacific, around the shoulder of North Manchuria, was occupied by Russia, and scientific explorations and settlement began. One of the first to penetrate that region was Carl Maximowicz, keeper of the herbarium of the St. Petersburg Botanic Garden. For three years he worked in the valley and returned home to write the first flora, in which he enumerated almost a thousand species. Other journeys into Amurland and the adjacent Pacific Islands brought an almost equal number more. Hence we have Amur privet. Hence, also that fascinating flowered bush honeysuckle mentioned in the first chapter—*Lonicera Maximowiczi Sakghaliensis.*

On his heels came Richard Maack, who discovered over six hundred species and is remembered in *Lonicera Maacki, Prunus Maacki,* and such beauties. Others followed these pioneers into the out-of-way corners of Asiatic Russia—Nicolai M. Przewalski, who penetrated Tibet; Albert Regel, who explored Turkestan in the 70's and 80's; Baron Alexander Schlippenback who opened up the treasures of Korea; Ernest R. von Trautvetter, who founded the Botanic Garden at Kiev and wrote "Flora Rossica"; and finally Dr. E. Bretschneider, who collected in many places and was a correspondent of the Arnold Arboretum.

In America an equally keen botanic curiosity characterized the various government expeditions into the West. James Pursh, Asa Gray and Dr. John Torrey worked on the specimens brought home, identifying and classifying them. The first of this trio we described in Chapter XIV; we should not pass by Torrey and Gray without a note on their careers.

John Torrey (1796–1873) laboured first as a physician in New York City and in 1824 was appointed to a chair at West Point, which he left three years later to become Professor of Chemistry and Botany at the New York College of Physicians and Surgeons. From his student days he manifested a lively interest in plants, writing his first book, a flora of New York City, at twenty-one. His two great works are "Flora of the Northern and Middle Sections of the United States," 1824, and, in collaboration with Gray, "Flora of North America," 1838–43.

Asa Gray (1810–1888) assisted Torrey in the laboratory of the New York Medical School and soon caught his fever for plants. While curator of the New York Lyceum of Natural History, he wrote his "Elements of Botany," 1835, the best book on the subject. In addition to his collaboration with Torrey, he wrote a "Manual of the Botany of the Northern United States."

As has been indicated, these plant-hunting forays were generally underwritten by botanic gardens or governments or far-sighted nurserymen. Here and there a wealthy and enthusiastic individual would send out a collector. One such was Baron Dietrich of Vienna, whose hobby was palms. At his own expense he sent a ship to collect them, and the collection of palms at the Brazil Museum in Vienna soon became famous. Another individual was James Bateman of England, who sent out orchid collectors. Bateman's "Orchidaceae of Mexico and Guatemala," 1837–42, is still one of the greatest books of the kind ever published.

Disseminating Plant Knowledge

The knowledge and appreciation of these new plants was spread by botanic gardens, societies, books and magazines, and by nurseries that propagated the plants for the market. Once again the activity was not limited to England, but is to be found also in other countries.

The Horticultural Society of London, started in 1804, was incorporated in 1809, and its *Transactions* began appearing in 1810. Sir Joseph Banks was the first president, being succeeded in 1811 by Thomas Andrew Knight, who held the post with honour for twenty-seven years. Provincial and colonial horticultural societies sprang up like weeds. Montreal started its society in 1830 and Toronto and Wellington, N. Z., in 1844. Another London organization, designed especially to interest students of scientific botany, the London Botanical Society, came into being in 1839. Meantime the American societies, patterned after London's, were instituted; and by 1858 Dr. Edward Regel (1815–1892) director of the Imperial Botanic Garden, had founded the Russian Horticultural Society. It gave its first flower show in St. Petersburg the same year. India had started its society by 1820.

Across the Channel horticultural organizations came about not so much through the influence of individuals, as in England, as by the merging of groups. In Germany the Deutschen Gartenbau Gesellschaft was founded in 1822, and its official organ, now called *Gartenflora,* begun. In the same year the society founded a horticultural college which afterward served as the nucleus of the Royal School for Gardeners. To the westward, the Société d'Horticulture de France was organized in 1827 and in 1854 was enlarged by the merger of several societies that gave it a membership of over a thousand. It is still an active influence in France.

In 1818 the London society opened experimental gardens at Kensington and Ealing, which were later discontinued when land at Chiswick was leased. Up to about 1885 the society was relatively small in numbers. Then, due to the energetic work of the Rev. William Wilks, the membership was built up from one thousand to sixteen thousand; the Vincent Street exhibition hall was erected, and the garden at Wisley was presented by Sir Thomas Hanbury. Recently a larger hall was built to afford better exhibition space, and the membership is now creeping up toward the amazing figure of thirty thousand.

These opening years of the 19th century saw a great increase in botanic gardens. That of Edinburgh moved to its present site in 1820. At Buitenzorg, Java, a garden was started in 1817, destined to become one of the best equipped in such tropical products as rubber, coffee and cinchona. James Hopper, a Kew-trained man, served as its first curator. The same year saw the garden on Trinidad established, to be followed by practically every one of the West Indian islands. Gardens sprang up in Calcutta, Singapore and Colombo. Rio de Janiero established its botanic garden in 1808, with Buenos Aires quickly following. Charles Fraser became keeper of the Sidney garden in 1828.

The purpose of these gardens was not alone to collect the plants of their respective regions for study, but also to propagate and distribute such as had economic value. Kew, for example, established the first Museum of Economic Botany in 1842. Another of the great works undertaken by Sir Joseph Hooker of Kew was to describe and classify the plants of the British Empire in a series of local flora. This work is still being carried on. So is the publication of the *Index Kewensis,* in which is recorded the name of every plant published, with references to the place of publication.

One of the most advanced steps was taken when, in 1872, two hundred and fifty acres and a small fund were deeded to Harvard University for the planting of a collection of trees. Thus began the Arnold Arboretum at Jamaica Plains near Boston. Under the leadership of Professor Charles S. Sargent (1841–1927) it grew to be the greatest of its kind. Professor Sargent is remembered for his "Sylva of North America," 1891–1902, and for the magazine *Garden and Forest,* which he founded in 1888 and edited until it ceased publication in 1897. Its equal has not since appeared in the United States. In the development of the arboretum, Professor Sargent's work was furthered by Jackson Dawson, Ernest H. Wilson, and Alfred Rehder.

Two other American botanic gardens followed: Missouri was founded by Henry Shaw in 1889, and at Tucson was set up a laboratory for the study of desert plants. The New York Botanical Garden came into existence in 1895 due to the energies of Dr. N. L. Britton and the Torrey Botanical Club.

Books and Magazines

It is beyond the physical scope of this chapter to name even a tenth of the books published in the first half of the 19th Century. Consider one country alone: Russia produced one hundred and eighty-three works on botany and horticulture in the first eighty years of the past century. Even more prolific were France, Germany and England. Botanies, floras, monographs on particular plant families, practical manuals on horticulture and forestry and fruit-growing all spilled from the presses in dizzy succession. Some of them proved to be landmarks in the advancement of science, some indicated the attitudes of society, a few dwelt on garden form. Because of their great number we shall restrict mention mainly to works in English.

Garden form had been so thoroughly discussed in the previous century that the reading public was pretty well satiated. Nevertheless, here and there in both England and on the Continent critics of garden art set down their pet theories. Echoes of the battle between naturalism and formalism kept muttering away for many years. Still the age was not so much interested in that topic as in the scientific and practical phases of horticulture. On many fronts the landscape designer was being overshadowed by the botanist and gardener.

Richard Morris in 1825 might write "Essays on Landscaping Gardening" and, ten years later, in France, Vergnaud's "L'art de Créer les Jardins" might grow vociferous in praise of the landscape architect; but these did not cause a ripple compared with Loudon's "Encyclopedia of Gardening." Between 1790 and 1820 Sowerby's "English Botany"—the standard for the 19th century—appeared in thirty-six parts. John Lindley, professor of University College, London, wrote numerous books; and even women entered the field of garden authorship. This last fact is worth especial noting. Priscilla Wakefield had written her "Introduction to Botany" in 1796, and Lady Charlotte Murray her "English Garden" in 1799. By 1806 Henrietta M. Moriarty composed "Viridarium or Greenhouse Plants," and Maria Jackson soon wrote "The Florist's Manual." These were the scouts of the feminist movement in botanical and horticultural authorship. The main column came streaming on soon afterward—Agnes Ibbetson, Elizabeth Steel Perkins, Louise Ann Twamley, Sarah Mary and Elizabeth Fitton. Professor Lindley tossed a rose their way, by writing the "Ladies' Botany" and Jane Webb Loudon, her husband resting beneath the sod, began turning out ladies' gardening books in amazing quantity.

This age also saw such highly specialized works appear as R. K. Greville's "Scottish Cryptogamic Flora" 1822–28, and Sir Humphrey Davy's "Elements of Agricultural Chemistry." Davy's book was an extension of the experiments Lavoisier (1743–94) had made on his farm at Frenchine in France. Boussingault (1802–87), Professor of Chemistry at Lyons and Paris, also was working along these lines. By 1840 Justus von Liebig (1803–73) had reached further scientific heights by his study of the functions of living plants in "Chemistry in Its Application to Agriculture and Physiology."

The garden's past likewise intrigued amateurs and students alike and when George W. Johnson's "History of English Gardening" appeared, in 1829, they read it avidly. Meantime, in America Amos Eaton was composing his popular botany; and in France, T. Buillier was writing a "Flora of Paris" and his fellow scientists were contributing learned works, especially the de Candolles, that botanical clan mentioned in the previous chapter.

Among British publications the *Botanical Magazine* continued, as it continues today, the most authentic picturing, of new and unusual plants. It was the first illustrated botanical periodical. On the death of its founder, William Curtis, in 1799, Dr. John Sims and then Samuel Curtis, a son, took over the editing. They were followed successively by Sir W. J. Hooker, Sir J. D. Hooker, Sir W. T. Thiselton-Dyer, Sir David Prain and Dr. O. Stapf.

Meantime others ventured on to the sea of publishing—Edwards with his *Botanical Register,* which lasted from 1815 to 1847; *The Botanical Cabinet,* begun in 1817; Maund's *Botanical Garden,* which filled stout volumes from 1825 to 1850. From 1826 to 1843 John Loudon edited the *Gardener's Magazine* which he had founded. The *Pomological Magazine* appeared in 1827, and from 1833 to 1851 Harrison's *Floricultural Cabinet* was published. In 1834 Joseph Paxton began his *Magazine of Botany,* and, finally, in 1841, Lindley and Paxton founded the *Gardener's Chronicle.* Of all these, the first and the last—Curtis's and the *Chronicle*—still appear. Curtis's claim for longevity is challenged only by *Gartenflora,* the splendid German magazine which has enjoyed existence since 1822.

The names of some of these editors have a romantic association. From 1847 to 1851 Hooker had collected for Kew in dangerous areas of India and was responsible for introducing the Sikkim rhododendrons. Paxton started as gardener to the Duke of Devonshire at Chatsworth. There he not only so far rejected naturalism as to introduce a *parterre de broderie,* but he also designed and erected an extensive hothouse that set the style for such ranges of glass for the cultivation of exotics on private estates. He later designed the Crystal Palace. After George III and Sir Joseph Banks died in 1820, Kew went into a serious decline that lasted over twenty years. It was revived through the efforts of John Lindley, Sir Joseph Paxton and Sir William Hooker.

In addition to botanic gardens and books and magazines, new plants were distributed and the knowledge of them spread broadcast by nurserymen.

England had many of them who attained high rank for both plant hybridization and plant introduction. James Gordon introduced the gingko tree to England. Conrad Loddiges laid claim to fame by producing, from 1818 to 1833, the "Botanical Cabinet," a work containing two thousand hand-coloured plates in twenty volumes, the most superb book on the subject published in England. Later came the great firm of Veitch, which sent out such famous collectors as Richard Pearse to Chile, Charles Maries and Ernest H. Wilson.

Although these English firms had splendid records, France and Germany can boast two companies that have had longer unbroken existences. One of the first seed shops in Paris was opened by Pierre Janfroid in 1728. His successor was Andrieux, who issued his first catalog in 1769. Ten years later the Vilmorins married into the family, and since 1779 the firm of Vilmorin-Andrieux et Cie has been enriching and serving gardens of France and the rest of the world. In Germany the seed house of L. Spath was founded in 1720 and descendants of its founders still conduct the business. Meantime in the United States the house of Landreth was thriving. The Kenrick nursery at Newton, Mass., was rolling up its record of eighty years, and Parsons Nursery at Flushing was gaining a reputation for the introduction of new American plants found by expeditions to the western areas of the country.

By still other paths was science venturing farther into the garden world. Hybridizing was one. Another was the improvement of tools and equipment. Early in the 19th century, for example, scientists experimented on the roof angles of greenhouses so that the plants growing in them would receive the maximum of light.

A century before, the Duke of Rutland had suggested heating these houses by flues, and by 1788 steam was first being advocated for the purpose, although it was not generally adopted until 1816. Hot water came in twelve years later.

The story of plant hybridizing is much more extensive.

Advancement in Hybridizing

In addition to the fact that artificial hybridizing was possible, the curiosity of many gardeners was piqued by the equally certain fact that one never knew what the crosses of pollen would produce. Both professionals and amateurs, in the first quarter of the 19th century, took to hybridizing enthusiastically. Practice made them more skilful, and new flowers and fruits began appearing on the market.

By 1829 Johnson's history stated that "florists now offer 700 varieties of tulips, 500 of ranunculus, 200 of anemones, 200 to 300 dahlias, 200 of narcissi, over 400 auriculas, 300 pinks, 350 carnations and 1450 roses." These are astounding figures, so astounding that one hesitates to believe them. Five hundred ranunculus! Where can we find a hundred varieties offered today? Or even fifty? Nevertheless, the Rev. James Tyso of Wallingford, the last great cultivator and seedling-raiser of this flower, made numerous contributions. Two other pollinators rose to leading stature along with him—Knight and Herbert.

The Hon. and Rev. William Herbert, rector of Stofford and dean of Manchester, has been dubbed the Father of English Hybridizing. As early as 1823 he was recording thirty new hippeastrums from his crosses. Thirteen years later he produced his great study of bulbous plants—"Amaryllidaceae," for which he not alone wrote the learned text but also made the illustrations.

The carnation was another plant that attracted the hybridizer's fancy. Thomas Hogg wrote a treatise on the carnation in 1820 and a special society for devotees of auriculas, pinks and carnations was formed. Over at Malmaison in France gardeners worked sedulously to bring to perfection the carnation known by the name of that garden.

Rose hybridizing soon became the object of specialists in both France and England—in France especially. Johnson's figures of fourteen hundred and fifty varieties of roses might appear fantastic had not Conrad Loddiges in his catalogue of the mid-30's stated that thirteen hundred and ninety-three varieties were growing in his nursery. Look at the records in France, and we can see with what fury new kinds were tossed on the market.

When France made a survey of its roses in 1800, only 100 varieties were known. Its first rose nursery was established by Vibert near Paris in 1815, and he is said to have originated nearly half the hybrid teas offered up to 1850. In 1829 Desportes and Prevost published a catalogue listing two thousand sorts. Down at Monza in Italy, L. Villaresi, the royal gardener, produced fifty varieties of *Rosa Indica* alone. It has been estimated that in the first half of the 19th century there appeared four hundred varieties of Moss roses, seventeen hundred Gallicas, three hundred and fifty Centifolias, two hundred and fifty Damasks, eight hundred China roses, five hundred Bourbons, three hundred and fifty Noisettes, two hundred Albas, one hundred and fifty Scotch, three hundred Hybrid Perpetuals and fifteen hundred Teas. Hybridists had not as yet begun to exercise that heartless rouging practised today. Probably every new kind produced, irrespective of its merits, was given a name and offered for sale. Of that enormous number listed above, not one-tenth can now be found. Yet among them were real beauties, lovely old Mosses and Damasks of the kind the American

Rose Society is trying to bring back into favour.

In this work of rose creation the French led the world. At Malmaison the Empress Josephine, a truly regal floriculturist, assembled all known roses of her day. At this first flower show no more than two hundred and fifty species and varieties were to be found. Encouraged by her, hybridists set to work. They made a goodly company, starting with André Dupont and passing on to such enthusiastic rosarians as Boitard (who wrote a manual on rose culture in 1836), Guillemeau, Leleur, Thorry, Deslongchamps, Forney, Portevner, Pierre Guillot, Guerin, Sylvain, Lamarche, Gounod, Levet (who produced Paul Neyron), Pradel (whose Maréchal Neil is still grown) and Vibert. Guillemeau wrote "Histoire Naturelle de la Rose," in 1800, Leleur, "De la Culture du Rosier," in 1811, and Vibert contributed many papers on rose nomenclature and classification. P. J. Redoute's magnificent rose books appeared in 1817 and 1824. There were comprehensive rose collections assembled at the Luxembourg, cared for by M. Hardy and later by Rivière.

It is well to remember these men. All too often the introducer of a new rose is given credit for it and the man who laboured over its creation is forgotten. In American catalogues the name of the hybridizer usually follows the name of the rose.

In the first crosses the French generally used the two Chinese species Tea and Chinensis (originally called Bengal) with *Rosa centifolia,* Damask and Gallica. The Tea Rose had been brought to Europe around 1800, the yellow Banksia in 1807 and the Persian Yellow, a double form of *Rosa lutea foetida* introduced from Persia in 1838.

In England the rose had already been drawn superbly by several hands. Mary Lawrence's folio of plates—"A Collection of Roses From Nature," appeared in 1799. She is remembered in the miniature *Rosa Lawranceana.* John Lindley wrote "Rosarum Monographia" in 1820; and "Roses," by H. C. Andrews, also accompanied by superb plates, came out in 1827. The next year Mrs. Catherine G. F. Gore was composing "The Rose Fancier's Manual," which gave an authentic listing of the roses then being raised. In America, six years later—indicating how widespread was the rose interest—Robert Buist published his "Rose Manual." Then in the 1850's William Paul brought out "The Rose Garden," a comprehensive study of the past and present of roses and their culture.

To the Empress Josephine goes the credit for holding the first exhibition of roses. England's national rose show has been held ever since 1858. Then came the Rose Society and a veritable torrent of rose books, many of them by the clergy, and in our own day Miss Willmott produced her monumental and lovely monograph the "Genus Rosa."

Other flowers subjected to hybridizing were dahlias, fuchsias and orchids, the successful growing of which was made possible by improved greenhouses. From Central and South America and India orchids poured into England and the Continent as explorers went deeper into the jungles to find them. So keen became the orchid enthusiasm that Kew set aside a special house for these plants and orchid houses on many private estates were erected. We shall hear more of orchids later on. Equally successful was the raising of other exotics and tender plants—begonias, gloxinias, geraniums, cyclamens, cinerarias and primulas.

The Rage for Fruit

In America, France and England pomology proved a favourite hobby among amateurs during the first fifty years of the 19th century. Thomas Andrew Knight (1759–1838) became England's leading fruit exponent; in Belgium, Dr. van Mons; and in France the Vilmorins and others.

Unlike his dilletante brother, Richard Payne Knight, this one, Thomas Andrew, was literally born in an orchard and chose to follow a countryman's life. He was as skilled at breeding cows, sheep, horses, dogs and poultry as he was at breeding fruit. A friendship with Sir Joseph Banks set him off on his work with fruit and vegetables. He produced new cherries, apples, pears and plums. He also experimented on such unrelated groups as the potato, the melon, the pineapple, nectarines and strawberries. Since in those days hybridizers did not keep exact records of their crosses, we cannot uncover the parentage of his new kinds.

Others in England who worked to improve strains were John Goss and Thomas Laxton, who specialized on peas, and Patrick Sherriff, who strove for better types of wheat.

Over in Belgium experiments with fruit were being pursued by some remarkable characters. About 1730, pear breeding had been undertaken by Fr. Nicolas Hardenport of Mons. He laboured for thirty years before he was satisfied with the varieties that came from his seed bed. Among his productions were Glou Morceau and Passe Colman, two types still grown. His example was followed by several of the Belgian clergy. In 1809 Abbé Dequesne of Mons launched the pear Marie Louise; and, about 1830, Mons. Deschamps, abbé of the orphanage hospital at Enghien, raised the pear Beurre d'Arenberg. Another Belgian worker was Dr. van Mons (1756–1842) who raised eighty thousand seedlings and in 1823 catalogued four hundred of them. Many of these were introduced into New England, where they became favourite varieties.

In France, Augustin Sageret worked to improve varieties of cantaloupes and melons. Others whose hybrids helped lift the standard were Charles Baudin of the Museum of Natural History in Paris; D. A. Gordon, professor at the University of Nancy; Louis L. de Vilmorin and his son Henri; and Henri Lecoq, director of the botanic garden of the University of Clermont-Ferrand.

Germany, too, had its enthusiastic hybridists—Dr. A. F. Wiegmann of Braunschweig; Dr. Karl F. von Gartner, who crossed and re-crossed persistently for forty years; Max Ernest Wichura, a jurist and botanist, who, although he worked especially with willows, is more popularly remembered in the Wichurâiana rose. In Belgium Louis van Houtte not alone edited "Flora des Serres," a famous work, but also found time to hybridize many irises, orchids and roses.

Coming almost to the threshold of our own era was that giant of hybridizing, that patient recorder of the laws of plant heredity —Gregor Johann Mendel (1822–1884). An Augustinian monk and teacher, Fr. Mendel served as abbot of the monastery at Brunn. For the eight years before he assumed this responsibility, he carried on his experiments in breeding peas, hawkweed and bees. Then in 1865 he delivered his findings in a paper he read at a local botanical society. The world rolled on, Fr. Mendel died, and not until 1900, when the paper was found, did Mendel's discoveries become revealed. Today the Mendelian law of heredity is the canon of hybridizers.

In our enthusiasm for these hybridizers, we have forgotten the original subject—fruit. There is still much more to the story. In 1811 the Horticultural Society of London offered prizes for plant breeding, especially of fruit and vegetables. It also began assembling a collection of fruit of the better sorts and distributing wood from them that they might take the place of the inferior kinds being grown. In the early 1830's it published a fruit catalogue. This recorded England as then growing one hundred and forty varieties of peaches and nectarines, four hundred sorts of pears and fourteen hundred sorts of apples. The small bush fruits, such as currants and gooseberries, were also being improved, and William Speechley was writing practical instructions for those who would grow fruit and vegetables under glass—grapes, pineapples, peaches, melons, figs and cucumbers.

The interest in fruit also produced three volumes remarkable for their illustrations—"Pomona Herefordiensis," 1811, by Thomas Andrew Knight, and two books by George Brookshaw. A flower and fruit painter by profession (he wrote two charming books on drawing flowers, the polite female cult of the day), George Brookshaw specialized in fruit illustrations. In 1812 he produced "Pomona Britannica," and in 1817, appeared his "Horticultural Repository." The plates in these volumes are remarkable for their beauty and accuracy. The historian of English fruit was Henry Phillip, to whose credit stand four excellent volumes—"Pomarium Britannicum," 1820; "History of Cultivated Vegetables," 1822; "Sylva Florifera," 1823; and "Flora Historia," 1824.

During this period America was fast crowding England for its fruit laurels. The American Pomological Society was founded in 1840, the British not until 1854. An indication of the American interest in fruit can be found in the fact that up to 1850 no less than five hundred varieties of fruit originated in New York State alone. The gentleman fruit-fanciers included some of the leading men of the day. Marshall P. Wilder grew two thousand varieties of fruit on his fifteen-acre estate outside Boston. William Hamilton of Philadelphia was such a pear enthusiast that in one shipment he imported five hundred varieties of European pears. Wilder was not content with being a mere fruit connoisseur; he also wrote and lectured on his favourite subject, and was one of the founders of the American Pomological Society. Out in Cincinnati Nicholas Longworth was rolling up an equally enviable reputation for his success with wine grapes.

While the fruit catalogue of the Horticultural Society of London was commonly consulted in America, the standard work on this side of the Atlantic was A. J. Downing's "Fruit and Fruit Trees of America," 1854. The same year appeared Thomas Bridgeman's "Fruit Cultivator's Manual." Two books before these had considered grape growing—"The American Vinedresser's Guide," 1827, by Alphonse Loubat, a French nurseryman settled on Long Island; and "The Economy of Kitchen Garden, Orchard and Vinery." Close on the heels of Downing and Bridgeman came John J. Thomas, a leading pomologist, whose "American Fruit Culturist," first published in 1846, enjoyed twenty-one editions. Six years later, the Rochester nurseryman, Patrick Barry, composed his "Treatise on the Fruit Garden."

Changes in Garden Styles

The average landscape architect today is apt to scorn the idea that new plants bear any effect on garden forms. Nevertheless, the 19th century, before that profession had gotten well under way, witnessed several marked developments that can be definitely attributed to the new plants being introduced and propagated.

Among the results of the explorations of the ill-fated David Douglas was the introduction of many new conifers. Europe had known of American arborvitae ever since the spoils of Cartier's expedition to Canada arrived in France, and Jacques Cornut had described it and some of the other evergreens. These were scant compared with the abundance of Douglas' finds and those that

William Lobb brought back. They were received enthusiastically, and any one in England who could spare the space on his estate was very much out of the swim unless he planted a Pinetum. Kew established one in 1843. Many of these trees now grown to magnificent mature specimens, are still the pride of English estates.

To William Lobb is also awarded the credit for introducing into England the Araucaria, the monkey puzzle tree, now found in every British suburban front yard.

In the same way, although not to the same extent, were new willows accepted and planted on country places. The weeping willow, *Salix Babylonica* had been brought to England in the mid-18th century. Other forms were introduced, and the Salictum or willow collection became another diversion for country gentlemen. Nor can we leave the willow without remarking on how its weeping forms became the symbol for the correct Victorian female attitude. The modest bending of their slim, pendulous branches, their response to the least breath of wind, readily typified the acquiescence that Victorian ladies were supposed to display.

Another explorer whose finds influenced English taste was John Jeffrey. He visited California in the middle of the century, and English gardeners thereafter show their partiality for such Pacific coast flowers as calochorti, clarkias, eschscholtzias, gaillardias, godetias, lupins and pentstemons. Meantime, too, Cape plants were being enthusiastically grown—heaths and pelargoniums and the multitude of colourful flowering bulbs.

These constant additions to the catalogues of available flowers naturally found an outlet in flower-garden forms, the most popular of which became mosaiculture or bedding-out. Count von Pluckler at Muskau had tried his hand at it, and, in Belgium, bedded-out floral decorations appeared in public parks. People, wearied of the flowerless gardens of the landscapists, began taking their flowers neat. In 1825 Richard Morris had advocated using the greenhouse for raising tender plants—annuals especially—that could be set outdoors when the weather grew milder—ageratums, fuchsias, lobelias, heliotrope, calceolarias, zonal pelargoniums, *Phlox Drummondi,* variegated alyssums, begonias and verbenas.

Plants that had colourful or strangely marked leaves, such as coleus and crotons, began to attract attention. These were referred to as "stove plants," because they had to be raised in advanced heat. In 1863 E. J. Lowe, and, six years later, Shirley Hibberd were extolling foliage in their books—the leperous spotting of *Pavetta barbonica,* the white pencilling of *Maranta vittata* and the violent markings of *Diffenbachia baraquiniana.*

The taste for these stove plants came originally from France, and many of the specimens grown in English hothouses had been distributed by French growers. At first these tropical and subtropical introductions were used as decorative accessories to hothouses. Then the gardeners of the Paris park system ventured to plant them outdoors in summer, making groves of rubber plants, caladiums, palms, cannas and begonias. The English immediately copied the style. It was a Frenchman, too, who did many of the important and effective crossings of variegated pelargoniums—Peter Grieve. He wrote a book on the subject in the middle of the century.

Those who could not afford such tropical luxuries raised sempervivums and sedums in quantity and spread floral rugs on their lawns. They consulted Charles Francis Hayward's work on the subject—"Geometrical Flower Beds," published in 1863. While bedding-out may not have required a high order of horticultural skill, the results had an undeniably quaint manner that endeared them to the Victorians.

Allied with this tale of exotics is the beginning of orchid hybridization. The first to venture on such crosses was J. Dominy of J. Veitch and Sons. The year was 1853 and the first flowers—he worked with Cattleyas—appeared six years later. Dean Herbert, a quarter of a century before, had suggested that orchids might be hybridized; but Dominy was the first to try it, and the first hybrid bears his name. For twenty years he continued the work. Others copied him in England and the French and Germans were quick to follow.

John Lindley became the British orchid authority, and on his death Dr. H. G. Reichenbach filled his place. Louis van Houtte, the Belgian nurseryman, also followed orchids closely.

Still a third product of the exotic house was water gardening. The first aquatic greenhouse was built at the Duke of Devonshire's place, Chatworth, for the purpose of growing *Victoria regia,* nymphæas and other water plants. It was regarded as a distinctly new departure in ornamental gardening. It remained for a Frenchman, however, M. Marliac, to produce hardy water lilies. This was about 1887. The outdoor water-lily pool may be said to date from that decade.

In the middle of the century England experienced a revival of Italian taste. Its leader was Sir Charles Barry who, having studied in Italy as a youth, returned to England and fortunately landed several commissions for important houses and gardens. Between 1840 and 1860 he was the favourite architect and landscape designer. One of his specialties was the sunk parterre, on which were beds edged with box and filled with colourful tender annuals. Italian statues cropped up and Italian balustrades became essential features. Joseph Paxton began displaying a Le Nôtre tendency in the gardens he designed, and he even re-introduced the *parterre en broiderie.* The formal garden had apparently once more come to stay in England. Even as late as the 90's Reginald Blomfield was championing it in a popular book and taking pot shots at William Robinson's informality. Likewise John D. Sedding, in "Garden Craft Old and New," was charmingly explaining the same predilection for formalism.

The Second Empire in France also took to flowers enthusiastically. Formal flower parterres, called *jardins fleuristes,* appeared on the more fashionable estates, and the taste, in turn, spread to Germany.

From time to time we have noted the outcropping of interest in alpine plants. England's first rockery was built at the Chelsea Physic Garden in 1772, when Sir Joseph Banks, on returning from Iceland, brought home some slabs of lava. At the time, repairs were being made on the Tower of London, and the old stones were dumped on the grounds. These, together with a collection of flints and chalks and broken brick, constituted the first English rock garden for the raising of alpine plants. By the third quarter of the 19th century rock gardening began to settle down to an established taste. In 1881 George Joad, an alpine enthusiast, gave his collection of plants to Kew, and a rock garden was thereupon built to accommodate them.

By itself, this fact may mean very little; viewed from a distance, it marks a distinct advancement in horticultural practice. Gardeners were beginning to give plants the environments of their native heaths. While the first rock gardens may have been mere travesties of mountain scenery, they displayed a commendable quality of intelligent effort, which was later to be found in the water garden and brook-side planting, in the wild garden and in the naturalizing of bluebells and daffodils in grass.

The most active guide of garden taste toward the end of the last century was William Robinson. A foe of bedding-out and all such artificialities in planting, he brought into popularity the herbaceous border and made the mixed shrub border the object of his most earnest solicitude.

Unquestionably England led the world in garden taste during the last half of the 19th century. Hinterland countries trailed her. In far-off India Englishmen still tried to impose the landscape garden on that terrain, and America was still reading such books as Andrew Jackson Downing's treatise on the theory and practice of landscape architecture and were slavishly copying his cottage residences. When Frederick Law Olmstead and Richard Vaux came to lay out Central Park in 1854, they treated those eight hundred and fifty acres to their best understanding of the old England picturesque landscape style.

The end of the century saw garden taste become eclectic. We took our gardens where we found them and placed them where we chose. On large estates one would pass from a French garden to a Spanish, and on to an Italian and would think such combinations nothing out of the ordinary. A few venturesome souls even tried transplanting the Japanese garden. A rash of subtropical plants broke out on lawns and the deluge of cannas and caladiums was upon us. The old century passed into time and the new appeared with flowers rampant and form a matter of any one's choice.

Meantime science had been advancing and, with a note on one aspect of it, we can bring this chapter of garden heterogenetics to a close.

The Rise of the Experiment Station

In 1851 at Mockern in Saxony there was established the first agricultural experiment station. Its leading spirit was Dr. Emil Wolff. During 1854 a young American student by the name of Samuel W. Johnson dropped in on this station to see what was being accomplished. So impressed was he that on his return he began agitating for such stations in America. Forty years before this Elkanah Watson had raised his voice proposing them. In due time Johnson became a professor at Yale and wrote a popular work, "How Crops Feed," which is still standard today. Due to his persistence, the legislature of Connecticut in 1875 appropriated $2800 to start such an experiment in the Department of Chemistry at Wesleyan College, Middletown. This was later moved to New Haven. So salutary were the benefits accruing from it that other states began copying the idea. Today the agricultural experiment station is found in every state and country.

Whereas in the beginning these experiment stations were employed mostly in trying out farm crops and soil treatments and methods of stock feeding and breeding, they eventually also became the test grounds for ornamental plants. In that respect they serve gardens and gardeners today. Plants are acclimatized, new varieties tested and soil methods studied. Here scientists toil away with microscope and test tube to find the cause and cure for plant diseases. Without the untiring work of these experiment stations many of our gardens would be made in vain.

CHAPTER XVII

THE THRESHOLD OF OUR OWN TIMES

IT is rather difficult to choose from the whirlpool of contemporary gardening tastes and endeavours those that seem endowed with sufficient capacity for development to influence the course of future gardening.

Consider some of these eddies—the feminist movement in American gardening, the almost universal gardening interest in England, the recent effort to quicken gardening interest in Italy. The endeavours of great horticultural organizations and the particular work of special plant societies. The sociological aspect of city allotment gardens. The evolution of the flower show. The rise of municipal gardens and great national parks. The establishment of garden villages and the effect of town planning. The specialization in garden practice. The tendency of present-day botanical exploration. The change of taste in plant material. These come tumbling one after another and, as they shoot by, we can take a swift glance at them.

Feminism in American Gardening

A stranger coming to this country for the first time—a stranger interested in gardening—would be struck by the distinctly feminist character of gardening in the United States. Whereas in England and on the Continent practically all aspects are led and controlled by men, here women are in the forefront. This is due to the phenomenal growth of the garden club idea.

The first faint pulsation of the movement was discernible in 1890 at Athens, Georgia, when a group of ladies formed the Athens Garden Club. It was a local group for mutual exchange of gardening experiences and knowledge. Various other localities began forming clubs with the same purpose. In 1913 at Philadelphia was founded the Garden Club of America. It is based on the tenet that interest in beauty and home betterment percolates downward through the classes of society. If the upper range evinces an interest in gardening, the taste for it will eventually seep down to those below. Meantime the garden club idea began spreading laterally and without regard for social classifications. Gardening leaped social barriers and became a universal feminine diversion. Instead of the selected few, small local garden clubs began springing up in great numbers, and these, in 1914, were amalgamated into Federated Garden Clubs. New York first, then other States following. Practically every State is now "federated." Being a member of a garden club is now a part of the essential social equipment of countless self-respecting and intelligent women.

It can readily be seen that these two great groups—the mass and the class—working toward a common purpose can become most effective agents for the advancement of gardening. Whereas their initial interest lay in the spread of gardening at home, it has now taken on civic responsibilities that range all the way from wild flower conservation and the splendid preservation of a noble Pacific redwood forest, which the Garden Club of America recently accomplished, to local roadside planting, preservation of bird life, and the landscaping of neighbourhood gasoline filling stations, railroad stations and the care of trees and plants on the commons of those small towns that cannot afford such service. Although during the past two years a counter-movement has arisen among men gardeners, and the Men's Garden Club of America has been formed, it cannot hope to catch up to the commendable work the women have already pushed forward. It is welcome, however, as a sign of returning sanity among the male of the species in the United States.

The women of the garden clubs are pursuing their purposes with intelligence and unflagging zeal. And not the least of these in recent times has consisted of bringing the garden indoors and giving new life to flower arrangements and the appreciation of floral decor. They have also caused many more flower shows to be held and have brought about many improvements in their staging.

The Evolution of the Flower Show

At various points in the past we have noted flower shows. Up to the beginning of the present century these were mainly exhibitions of horticultural skill. They consisted of rows and rows of potted plants set on tables or totally artificial arrangements of vegetables and fruit. Although they interested the competitors, they were not calculated to enthrall the populace.

Then came in—due a great deal to the vision of women—the habit of displaying flowers as they grew. Flower shows have now become garden demonstrations. If one wants to show daffodils, one makes a daffodil garden. The same is true of roses or alpine plants or azaleas or any other flower groups. This new display method is of inestimable value because it helps visualize for the attending public how flowers should be grown and how they provide a setting for the home. Today even the unlettered public can catch from these displays a genuine and lasting enthusiasm for the beauty and usefulness of gardens. Whereas the old style of show drew relatively small crowds, today the English throng the Chelsea spring show; and, wherever in America such exhibits are staged, the public are attracted to them in great hosts.

Due to the enthusiasm of garden clubs, the local flower show has become an annual event in countless small cities and towns and is serving to awaken neighbourhood interest both in the home garden and in the civic aspects of gardening. So numerous have become these local exhibitions that not enough judges were available to pass on the merits of the competitive displays, and so each year courses in judging are conducted and aspiring men and women go to school with pencil and pad and nervously take an examination at the conclusion of the course.

In one respect England is further advanced than the United States—the outdoor flower show. Except for sporadic attempts, this type of flower exhibition has not been ventured here. As it is a highly localized problem, no set of rules applicable in one place necessarily fits the other.

Another factor in the evolution of flower shows both in America and abroad has been the growth of the special plant societies. These were a logical outcome of the spread of garden enthusiasm. Some flowers appealed to certain people more than others, and these specialists banded together to support and disseminate knowledge and enthusiasm for their own particular group of plants. The rose, the iris, the peony, the dahlia, the gladiolus, the sweet pea, the chrysanthemum—scarcely a plant family exists but has its own group of supporters. Viewed from a sardonic distance, some of the work of these societies is not unlike cheering for the local team; nevertheless they are making constant advancement in the culture, health, classification, nomenclature and general improvement of their chosen plants.

These particular societies hold flower shows of their own group of plants, either alone or in conjunction with a general exhibition. They have also accomplished a most worthy purpose in inducing municipalities to install display gardens in public parks. The rose garden in Elizabeth Park at Hartford, for instance, was the first municipal display of roses in the United States. Now quite a number of cities have public rose gardens. The same is true of peonies and iris.

Town pride, warmly supported by the local garden club and the chamber of commerce, has developed a flower-advertising method peculiar to America. A city chooses a flower, tree or shrub that flourishes especially well in that locality, and great plantings of it are made and the populace of the outlying countryside induced to come and see the display when the blooms are in perfection. Thus Portland, Seattle, Los Angeles and Sacramento and other cities hold magnificent rose festivals and roses are planted in every dooryard and along the public ways. Atlanta has chosen the peach blossom, Omaha the hollyhock, Rochester the lilac.

Garden Specializing and the Landscape Architect

Another outcome of the particular flower societies (or perhaps the societies exist because of them) is specialization in gardening. The rose enthusiast has a rose garden, and according to the measure of his enthusiasm for the rose does he disregard other flowers. In the same way the alpinist has a rock garden, and will try out every conceivable kind of plant that can go logically into that environment. The iris enthusiast loses interest in his garden when the last iris blooms. Those particularly interested in nymphae and swamp plants make a water garden, and the narcissus specialist has her naturalized areas and her group plantings. The lover of native plants develops a wild garden. In these diverse ways is horticulture subdivided today.

And it is only natural that it should be. Unless one has extensive acreage and can afford a large staff, he and she are obliged to choose one phase of horticulture and stick fairly close to it. Almost inevitably does the persistent gardener become a specialist.

Because of this specialization in plants, we cannot say that any one form of garden is typical today. Whereas in the past garden form was dictated by architects, today it is dictated by amateur botanists and gardeners. The landscape architect must be equipped in many ways to serve the desires of clients who are flower specialists. Nevertheless in both England and America a process of education in garden design is gradually being pushed and should result in a higher appreciation of the landscape designer's skill and in better gardens.

The great field for the landscape architect, apart from the extensive private estate, lies in town planning and the designing of real estate sub-divisions and parks. This was originally the metier of the architect, but since the employment of landscape architects in laying out parks, the latter have assumed much of the work. Because of his almost slavish fidelity to established styles, the architect of the past, even in designing a dwelling, was apt to consider the style first and the occupant afterward. The laying out of parks and towns and subdivisions is not foremost a problem of style; it is a problem of how to serve the requirements of human beings. Somehow the modern landscape architect seems more on the side of mankind than the architect. But, whether designed by one or the other or both working together, the area allotted to parks and gardens in any given town is an essential factor in the well-being of the populace. Even in mediæval times this was apparent, and the alamedas became green oases in the packed deserts of houses. It gave English towns and their descendants the common, and Spanish towns the plaza or central public square.

In America the almost universal ownership of motor cars has caused a new form of park to spring into being. Parks were originally city squares and these sufficed through the age of horse-drawn vehicles. The gentry and the commonalty alike could ride or walk around them. But the automobile, capable of going great distances, necessitated the building of long trunk lines. The square park became elongated into a far-reaching boulevard, and these country-penetrating boulevards are being landscaped most successfully. Again trees and shrubbery and clumps of flowers and stretches of green grass assert themselves as essential to the populace.

It was said of Humphrey Repton that he leapt the hedge and made all England a garden. Some of that same sort of national beautifying has captivated the imagination of American garden clubs. Not the least element in spreading garden interest in the United States has been the realization that gardens make towns more desirable to live in and advance real estate values. On the other hand, America has not been so quick to grasp the need for allotments as have Continental countries and England.

Allotments, National Parks and Garden Cities

Begun in Germany during the closing years of the last century, the allotment idea offered a valuable solution for the waste land that fringes cities and towns. Not entirely urban nor entirely rural, these belts of empty lots were allowed to become either dumps or unsightly wastes. Then a German idealist hit on the excellent notion of dividing them into small garden plots that workmen could plant to vegetables. Thereby their tables were served, the land improved and beautified and many men and women given a healthy outdoor exercise at little expense. From Germany this allotment idea spread through the Continent and England and has become an invaluable factor in sociological advancement. What's more, it has made enthusiastic gardeners out of men who otherwise lacked gardens and has opened their eyes to the beauty of flowers. Many of them, passing up the more practical vegetable, now prefer flowers for their crops.

Sporadic attempts to institute allotments have appeared in the States, the idea being especially fathered by large factories. But it must be confessed that the foreigners among the workmen have grasped the opportunity with more readiness than native sons. The importance these allotments are given abroad can be gathered from the fact that no town-planning is undertaken without making provision for them.

On the other hand, when we stray from the restricted limits of allotments to the wider fields of the national park, we find the United States taking the lead. One of the functions of the state is to protect people from the more predatory and voracious of their kind. In the old days of the Empire, Augustus was praised for having given Rome back to itself by establishing parks for the public. In the United States areas of great scenic beauty are set aside that the people may enjoy them in perpetuity and that their beauty may be preserved and protected against encroachment. Some of these areas are declared national parks by government mandate, some purchased by the state and federal governments, sometimes philanthropic citizens contribute the land.

Through these various channels the garden, both public or private, has assumed the responsibility of a public service. We realize today that no man makes a garden for his own pleasure alone. If it is a private garden, it sets an example to the neighbourhood. If it is a public garden, it must serve all sorts and conditions of men. We may point with pride to the scientific advancement of our times, to the widening interest in horticulture both as a hobby and an art, to the multitude of gardening books being published, to the thoroughness with which the hinterlands are being searched for newer beauty in tree and shrub and herb, to the persistence and high standards of hybridists—all these are worthy of praise, yet had our times not made these contributions, we could still mark a great advancement in the growing idea of gardens as a public service.

Present Aspects of Plant Exploration

While our own times have seen many more areas searched by the plant hunter and many old regions re-scoured, botanical exploration has undergone several definite changes in the past thirty years. The Japanese have made diligent search of their own lands and colonies—Korea, Manchuria and Formosa especially. For twenty years now China has been taking an interest in its own botanical wealth, in addition to encouraging intensive study by foreigners. When Forster published his "Florula Sinensis," in 1771, he listed only two hundred and sixty species of Chinese plants. Today we know between eighteen thousand and twenty thousand. Since the beginning of the present century five hundred new species of Chinese rhododendrons alone have been found and described.

In two respects we can mark new tendencies in this botanical work. Whereas Europe for many centuries was the centre of this interest, the United States is fast becoming the most active leader. Arboretums, botanic gardens, societies, syndicates of amateur gardeners are all supporting plant exploration and the acclimatization of new plants and constantly making valuable contribution to the sum total of the world's knowledge of them.

In a recent address before the National Shade Tree Conference, Dr. E. D. Merrill pointed out how the centre of interest in the flora of Eastern Asia has shifted: "With Thunberg, Upsala became an early important centre for work on the Japanese flora. London also early assumed an important place through the activities of the Royal Botanic Garden at Kew. Then Paris took the lead through the enormous botanical collections sent home by French missionary priests. Leningrad, Berlin, Vienna, Utrecht, Edinburgh, and other botanical centres in Europe have assumed influential rôles, while in our own country the Arnold Arboretum, taking an early interest in Eastern Asia, financed expeditions by Sargent, Wilson, and Rock. The National Geographic Society in Washington, the United States Department of Agriculture, and, more recently, the University of California have entered the field, while the New York Botanical Garden is actively assembling reference material."

He further marks the fact that contemporary plant exploration is filling in the line when our own line falters. The chestnut blight strips the United States of chestnuts, and eventually in China plant explorers find a blight-proof species to supplant those that have died. Let elms succumb to the Dutch elm disease, and already China is supplying our gardens with a species that appears to be immune.

Moreover, as new plants are discovered, we are drawing the line sharper between those plants that are merely of interest to botanists and those that can add new beauty to our gardens or serve a public need. A new Tibetan primula that is curious only to the botanist is apt to remain an herbarium specimen or a living plant of it is kept in botanic gardens for study. Let it add a new range of tints to the primulas being grown in average gardens, and that beauty makes it doubly valuable. Or it may be a species of rose or of fruit that can give its hardiness to the strains we already grow, and thus push those rose and fruit frontiers farther into the north.

Revival of Amateur Botany

A century ago botany was among the polite studies for well-bred women in England and America, as the number of botanical works addressed to them convincingly attests. In recent years the specialization of flower interest has begun to revive that attitude toward botany. Take the course of the amateur iris fancier, for instance. The interest usually starts with the tall bearded types, passes on to the beardless and soon widens to include those that are listed as botanical types. The growth of this scientific aspect of amateur gardening can be marked by taking the catalogue of any well-stocked nursery of twenty-five years ago and comparing with it the present catalogue. Rose species, species of iris, rare alpines

—all gradually are lengthening their cords. It is the relatively new gardener who clamours for florists' "novelties"; the initiated demand species.

This demand has given rise to specialized nurseries and to more diversified stocks carried by average nurseries. The way in alpines was first broken in 1875 by Correvon in Geneva; today nurserymen who specialize in alpine plants are legion. The same is true of roses, peonies, iris and flowering shrubs. And to a degree much of the credit should go to the amateur gardener. Except in rare instances, nurserymen have not proved themselves outstanding in plant leadership. To one Lemoine who produces new lilacs and mock oranges, and a Jackman and a Henry, new clematis and campanulas, there are hundreds who merely grow along and merchandise the same old stock, and they are pulled out of the rut only when the amateurs' demand for better varieties becomes overwhelming.

Tides of Taste in Plants

Perhaps some of the nurseryman's hesitation is due to the fact that he realizes how fickle public taste can be. Though the tides of taste in flowers and plants move slowly, they do change.

In this year of grace 1934 an observer of horticultural matters can note in America alone a marked increase of interest along fully a dozen lines. The English enthusiasm for narcissus breeding—an old story over there—has begun to appear on this side of the Atlantic. The exclusion of bulbs by government edict, only quickened the desire for newer and better sorts. In iris hybridizing the United States is leading. We are also producing the best peonies, with the single and Japanese types threatening to become a cult. The hemerocallis, for some time subjected to the hybridizer's skill, has been vastly improved, and a collection of the newer kinds sets a garden apart from its fellows. Alpines have been enormously popular and America is beginning to realize what rare beauties it can find in its own mountain ranges. From the Philippines are appearing new groups of plants suitable for growing indoors in the average home. The fuchsia is enjoying a new interest, and old types, long since forgotten, are being propagated.

Then there are the cults of desert plants, national plants, herbs and the effect of modernistic decoration and architecture. These deserve elaboration.

The Herb Revival

Such a venerable tradition has gathered around herbs, so much romance and picturesque simple faith, that any renewal of interest in the past is apt to start a revival of interest in herbs also. This revival has taken three courses—medical, gastronomic and in design. The acceptance by the medical profession of mineral drugs and the general surrounding of medication with an aura of professional secrecy was bound to bring on a counter-movement. While Culpepper's old Doctrine of Signatures is not being revived, there is apparent today a growing belief in the efficacy of drugs derived from growing plants. Botany promises to assume its rightful place once more in medical education. Nor is this merely a quaint fad followed by a few enthusiasts. There is a growing realization that plants play a vital part in the life and health of man and that the "simples" concocted by our grandmothers were efficacious and not to be scorned.

There has also been revived an interest in herbs in cookery. This is a regularly occurring enthusiasm. The human palate is not so fickle as it is easily satiated. New tastes in foods always receive support from the discerning, and it is the gastronomically discerning who lead this phase of the movement today. Several splendid and scholarly books on herb growing and cookery have appeared in the past decade.

The logical result of these two influences has been the reappearance of the herb garden. Traditionally a formal type of planting, the herb garden fits in particularly well with the contemporary tendency of garden design, which is tending toward formality.

The Cults of Desert and National Plants

While there has always been more or less interest displayed in succulents since that far-off 15th century day when an exploring Spaniard brought home the first cactus from the New World, no time has seen so widespread an enthusiasm for them as our own. There is a pronounced interest today in desert plants. Some of this is due to the rage for rock gardening, since many of the smaller succulents find their homes among rocks, and some to a concentration of interest in desert localities. A few years back there was displayed at flower shows on the Atlantic seaboard a desert garden with living plants that had been transported *in toto* from the Far West. This was also displayed in London, where it has become a permanent exhibit. In California, desert gardens have attained the plane of being fashionable, and wealthy and poor alike go in for them enthusiastically.

In a sense, the desert garden referred to was a form of promotion, and this type of justifiable advertising will doubtless appear quite often in the future. Only a few months back the Royal Horticultural Society gave room to a government display of South African wild flowers. Our garden clubs, in their conservation work, constantly display the flowers of a given locale that should be saved, and many gardeners are giving such plants the benefits of a cultivated environment. The wild garden is a form of horticultural interest that William Robinson extolled thirty years ago in England—and his enthusiasm is bearing abundant fruit today.

Another factor that brought succulents back to favour—cactuses, sempervivums, aloes and sedums—was the desire of people living in city apartments to have plants that would tolerate neglect, vitiated air and the extremes of heat. City window-gardeners have found that such plants satisfy these vigorous requirements.

Moreover the modernist functional interior appears to offer exactly the right background for these succulents. This new taste, appearing first in Central Europe, has spread over the world. Against the plain walls and severe windows of modern rooms, the strange forms of succulents give just the desirable note. Cactus windows are now a commonplace and the rubber plant, the forgotten idol of suburbania, is again enthroned.

While gardens to fit the exacting requirements of city apartments may be limited in scope, sufficient ingenuity has been aroused to make these gardens quite diverse. The Wardian case with electric heat attached is now giving us home-grown orchids. The terrarium is a fond device of many apartment dwellers, and the water plants necessary to aquaria and the life of indoor fish are also spreading horticultural knowledge to those who must garden with little or no soil and restricted sunlight.

The Decline of Fruit Interest

There was a time in England and America when fruit-growing was a gentleman's hobby. He might not be interested in vegetables, he might even scorn flowers as beneath his robust constitution, but his fruit was always a source of pride. Now the great orchards have supplanted the home garden. True, fruit is grown, but not so universally as in the past, nor at our horticultural exhibitions do we find so many amateur fruit displays. On the other hand, gardeners in the United States are beginning to show an interest in growing fruit in the espalier style of the Continent. "Crucified fruit," as Aldous Huxley calls it in one of his stories.

This custom, of course, presupposes a wall—and American gardeners are not given to walling in their places. The democratic urge which abandoned fences and made whole suburban blocks one garden is gradually passing, however. Our realization of the benefits of privacy will eventually overcome the fetish for gardening *coram populo.*

Colour Enthusiasms

Another phase of gardening interest which has been subject to change is the problem of colour. Several years back Gertrude Jekyl set the style of working out colour schemes and successions in herbaceous borders. To the English this may be a fairly easy matter; to the American it is a constant source of disappointment. Indeed, it is questionable if the mixed herbaceous border is the ideal way of growing flowers in the varying and exacting climates of the United States. French gardeners have never altogether given up the custom of growing flowers in definite colour blocks or beds. This descendant of the old bedding-out style has its merits that will probably be appreciated as time goes on.

Meanwhile colour fads come and go and those who would be precise in their gardening insist on all-blue gardens or all-yellow or all-white. A contemporary enthusiasm for white in interior decoration has caused the all-white garden to become immensely popular.

Meantime, on these matters of garden colour and design the modernist has much to say.

The Modernist Movement and Gardening

Just as the last quarter of the 19th century showed an unrestrained eclecticism in garden design and laid out Spanish, Italian, French, English cottage gardens cheek by jowl, so during the first quarter of this new century have garden designers been eclectic. With this difference—instead of making complete stylized gardens, they now mix several styles in the same garden.

The late M. Jean Forestier extended his interest to Morocco and Spain and old Rome. His garden designs contain Roman pergolas, Saracenic kiosks and water-runnels, Persian tiled pavements, French vegetable sculpture and the mediæval covert walks of architectural wooden frames thatched with vines—all these elements mingled in pleasant accord. The Brothers Vera represent another French taste; they have gone in for a revival of solid colour blocks of flowers and the use of coloured rock and pebbles and topiary work.

In Germany the taste for naturalistic rock gardens is being gradually eclipsed by formal rock gardens built in a series of stone-supported terraces. Certainly such rockeries present no such abrupt transitions as the Queen Anne cottage that flaunts a miniature Matterhorn in its back yard. Moreover, these modern terraced rockeries have somewhat reduced the perils and physical exactions of rock gardening. The Germans have also changed the style of rose gardens. Instead of planting roses in the usual bed that lets the gardener work from each side, these new Teutonic roseries are planted like a checkerboard—a square flat stone and a rose bush, then another slab and a bush, and so on.

The modernist designer tends toward a simplification of work. He objects to extensive lawns, for example, because they require expensive maintenance. Instead he paves much of the garden area. These paved gardens, with low-growing plants flourishing in the cracks, have become accepted abroad and the taste for them is spreading to other countries. Carrying his theory still further, the modernist complains that flowers require time, expense and effort to maintain, and consequently supplants them with coloured pebbles and cement. This, of course, is gardening reduced to its lowest possible absurdity. It also is a revival of a very ancient mediæval custom that filled its geometric beds with patterns of coloured river pebbles.

As we near the end of this Story of Gardening, we become aware of how little there is in gardening that is absolutely new. The modernist has dropped back several centuries. The terraced gardens of skyscraper apartments have gone all the way back to Babylon.

Here is a form of gardening that proves how readily some plants can be made to accommodate themselves to new and unusual environments.

The stepped-back style of architecture is very ancient, yet when city ordinances were recently enacted to provide sunlight and air for all, architecture delved into its past for the solution. The stepback made a terrace, and on these terraces city dwellers are now making gardens. In Chicago, if legend be true, there is a garden club to which no one is eligible except he lives above the thirteenth floor! Shades of Thomas Fairchild and the plants he picked out for his fellow Londoners to grow! Well, our horticulturists have now succeeded in selecting the plants that will survive on these terraced gardens and we are learning how to protect them against wind, how to keep them clean and healthy.

With these the cycle is completed and the end of the Story of Gardening finally reaches its beginning. For these modern hanging gardens on the terraced apartments of the New World are made to satisfy the insistent craving for country beauty that haunts those obliged to live in cities. And that same craving for flowered upland meadows and tree-ranked hill-sides brought such homesickness to his Median bride that Nebuchadrezzar could not ease it until he had planted the first hanging gardens in Babylon long ago.

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